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NEW APPLICATION

Tucson Electric Power Company



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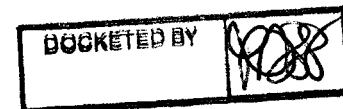
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July 2, 2007

Docket Control
ARIZONA CORPORATION COMMISSION
1200 West Washington Street
Phoenix, Arizona 85007
E-01933A-07-0401

Arizona Corporation Commission
DOCKETED

JUL 2 2007



Re: Tucson Electric Power Company's Demand-Side Management Portfolio
E-01933A-07-_____

Docket Control:

Pursuant to Arizona Corporation Commission ("Commission") Decision No. 69568 (May 21, 2007), enclosed please find an original and 13 copies of Tucson Electric Power Company's ("TEP" or the "Company") proposed Demand-Side Management ("DSM") Portfolio 2008-2012 (the "DSM Portfolio").

The DSM Portfolio contains the following programs:

- (i) Residential New Construction (Guarantee Home Program);
- (ii) Low-Income Weatherization;
- (iii) Shade Tree;
- (iv) Education and Outreach;
- (v) Residential HVAC Replacement;
- (vi) Efficient Commercial Building Design;
- (vii) Non-Residential Existing Facilities;
- (viii) Compact Fluorescent Lamp Buydown;
- (ix) Small Business; and
- (x) Direct Load Control.

TEP is filing the Direct Testimony of Ms. Denise Smith in support of the DSM Portfolio which includes the DSM Portfolio Plan and details of the DSM Adjustor Mechanism (including the DSM Efficiency Incentive and the DSM Performance Incentive). TEP is requesting that the Commission approve the DSM Portfolio in this proceeding but that the DSM Adjustor Mechanism be approved in the TEP rate case proceeding that is being filed with the Commission this day. TEP incorporates by reference any information

presented in the TEP rate case that the Commission deems necessary in order to approve the DSM Portfolio in this proceeding.

Accordingly, the Company requests that the Commission (i) establish a docket for the consideration and approval of the DSM Portfolio; (ii) issue a Procedural Order establishing a hearing schedule in the docket; (iii) order a Procedural Conference to be held at its earliest convenience to discuss the submittal of additional testimony and exhibits in the docket; and (iv) issue a final order approving the DSM Portfolio, contingent upon the establishment of a DSM Adjustor Mechanism to recover the costs thereof.

If you have any questions, please do not hesitate to contact me at (520) 884-3664.

Sincerely,


Michelle Livengood

Enclosures

cc: Chairman Gleason

Commissioner Mundell

Commissioner Hatch-Miller

Commissioner Mayes

Commissioner Pierce

Ernest Johnson, Esq., Director, Utilities Division

Christopher C. Kempley, Esq., Chief Counsel

Lyn Farmer, Esq. Chief Administrative Law Judge

Ms. Barbara Keene, Utilities Division

Mr. Ray Williamson, Utilities Division

Mr. Jerry Anderson, Utilities Division

Ms. Julie McNeely-Kirwan, Utilities Division

Parties to the TEP rate case

1 **BEFORE THE ARIZONA CORPORATION COMMISSION**

2 **COMMISSIONERS**

3 MIKE GLEASON - CHAIRMAN

4 WILLIAM A. MUNDELL

5 JEFF HATCH-MILLER

6 KRISTIN K. MAYES

7 GARY PIERCE

8 IN THE MATTER OF THE APPLICATION OF) DOCKET NO. E-01933A-07-
9 TUCSON ELECTRIC POWER COMPANY FOR)
10 APPROVAL OF ITS DEMAND-SIDE)
11 MANAGEMENT PROGRAM PORTFOLIO)
12 PLAN.)
13)
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13 Direct Testimony of

14
15 Denise A. Smith

16
17 on Behalf of

18
19 Tucson Electric Power Company

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24
25
26 July 2, 2007
27

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Exhibits:

Exhibit DAS-1	TEP's DSM Portfolio
Exhibit DAS-2	DSM Adjustor Mechanism Methodology
Exhibit DAS-3	Description of DSM Adjustor Mechanism Tariff Rate
Exhibit DAS-4	DSM Adjustor Mechanism Tariff (example)
Exhibit DAS-5	Proposed 2008 DSM Adjustor Mechanism Tariff – Calculation
Exhibit DAS-6	DSM Efficiency Incentive Calculation
Exhibit DAS-7	DSM Performance Incentive Calculation

1 **I. INTRODUCTION.**

2
3 **Q. Please state your name and address.**

4 A. My name is Denise A. Smith. My business address is 4350 E. Irvington Road, Tucson,
5 Arizona.

6
7 **Q. What is your employment position?**

8 A. I am the Director of Conservation and Renewable Programs for Tucson Electric Power
9 Company ("TEP" or the "Company"), UNS Gas, Inc. and UNS Electric, Inc.

10
11 **Q. Please describe your education and professional background.**

12 A. I graduated from Northern Arizona University ("NAU") in 1991 earning a Bachelor of
13 Science degree in Mathematics with an extended major in Statistics and then completed
14 graduate work in Statistics at NAU. After leaving NAU, I was hired by Pima Association
15 of Governments in 1992 in the Travel Reduction Program, which reduces vehicle
16 emissions by targeting major employers to minimize employees' travel to and from work.

17
18 I was hired in 1996 by TEP as a Demand-Side Management ("DSM") Analyst, developing,
19 analyzing and researching new DSM and energy-related market programs. During that
20 time I also implemented and reported on the progress of existing DSM programs and
21 transitioned DSM programs into market-transformation programs. In 1999, I moved into
22 the Pricing and Rates Department, developing cost-of-service and revenue requirement
23 models. In 2002, I was promoted to the Director of the Pricing and Rates Department. I
24 then accepted the position of Director of Conservation Services. Most recently my position
25 was expanded to include Renewable Programs. I manage the successful TEP Guarantee
26 Home Program ("GHP") and, for the past year, have been researching and developing new
27 DSM programs for UniSource Energy Corporation ("UniSource Energy") and its affiliates.

1 During my tenure at TEP, I completed a Masters of Business Administration at the
2 University of Phoenix.

3
4 **Q. What is the purpose of your testimony in this proceeding?**

5 A. The purpose of my testimony is to present the Company's proposed Demand-Side
6 Management ("DSM") Program Portfolio Plan for 2008 through 2012 ("DSM Portfolio"),
7 which is attached hereto as Exhibit DAS-1. My Direct Testimony begins with some
8 general comments on the Company's proposed DSM Portfolio, including responses to
9 requests for information by Arizona Corporation Commission ("Commission") Staff in
10 TEP's Motion to Amend Decision No. 62103 (Docket No. E-01933A-05-0650) ("1999
11 Settlement Agreement Amendment Case"). I explain the specific DSM programs which
12 the Company proposes at this time. Consistent with Commission direction in Decision No.
13 69568 (May 21, 2007), I then discuss cost recovery mechanisms for DSM expenses. (I
14 should note that while I present information regarding cost recovery mechanisms in this
15 proceeding, we are requesting approval of the DSM cost recovery mechanism in the rate
16 case that TEP filed pursuant to Decision No. 69568.) I conclude by responding to
17 suggestions of some energy efficiency advocates for an energy efficiency standard ("EES").
18

19 **II. GENERAL COMMENTS ON THE COMPANY'S DEMAND-SIDE**
20 **MANAGEMENT PORTFOLIO.**
21

22 **Q. Ms. Smith, what is the general purpose of the proposed DSM Portfolio?**

23 A. TEP, like other Southwestern electric utilities, has been experiencing an increase in annual
24 peak hour demand over the last several years and an accompanying increase in annual
25 energy sales. From 2002 through 2006, annual peak-hour-demand increased at a rate of
26 5.64 percent per year and annual energy sales increased at a rate of 3.59 percent per year.
27 While the Company has sufficient generation capacity or capacity purchases to meet its

1 expected demand for the next few years, it is in the interest of our customers and
2 shareholders to pursue the development of cost-effective "negawatt" capacity through the
3 various load reduction programs.

4
5 In 2006, annual peak-load demand, including losses, was 2,365 MW. However, the load
6 duration curve is very steep. The upper 36 MW of demand occurred over only eight hours
7 of the year. The upper 127 MW of demand occurred over 28 hours of the year and
8 represented only 0.0162 percent of the annual incremental energy sold. The upper 88 load
9 hours, or 1 percent of annual hours, represented 246 MW or 10.4 percent of demand and
10 0.0775 percent of the annual incremental energy sold.

11
12 This information suggests an opportunity for using cost-effective DSM measures to reduce
13 the need for additional generating capacity in the future. TEP's proposed DSM Portfolio
14 meets the goal of reducing both annual peak hour demand and annual energy consumption
15 in a cost-effective manner.

16
17 **Q. Is the Company planning to propose any other measures to reduce annual peak hour**
18 **demand and annual energy consumption?**

19 **A.** Yes. In its rate case, the Company proposes two rate designs that will support reduction of
20 annual peak hour demand and annual energy consumption. First, the Company proposes
21 inverted block rates for residential and commercial customers that will provide an
22 additional financial incentive to reduce energy consumption. That financial incentive will
23 be equal to the differential in incremental energy rates between the lowest tier of rates and
24 the middle or upper tiers of rates, and should reduce year-round energy consumption.
25 Second, TEP's proposal for Time-of-Use ("TOU") rates will provide additional financial
26 incentives to reduce energy consumption during times of high demand. While these rate
27 proposals are not specific elements of our DSM Portfolio, they will effectively provide

1 additional financial incentives to customers to utilize the DSM program offerings.

2
3 **Q. Staff previously has requested specific information about the Company's DSM**
4 **Portfolio. What information is TEP providing in support of its DSM programs?**

5 A. The Company is providing the detailed information Commission Staff requested in the
6 1999 Settlement Agreement Amendment Case. For example, at the request of
7 Commission Staff, TEP utilized the Societal Cost ("SC") Test to analyze the cost
8 effectiveness of potential DSM programs. The Company does not agree that the sole use
9 of this cost-benefit test suggested by Staff is the only appropriate measure of effective
10 DSM. The Company has, however, provided the information in response to Staff's
11 request. The Company believes that the requested SC Test should be conducted along with
12 the Total Resource Cost ("TRC") and Rate Impact Measure ("RIM") tests.

13
14 The only way to establish the rate impacts of a DSM program is to test the program under
15 the RIM test. A RIM benefit/cost ratio of one or greater ensures that the program will put
16 downward pressure on rates. Conversely, if the RIM ratio is less than one, the program
17 will put upward pressure on rates. The Company feels obliged to avoid unnecessary rate
18 increases. Because the Company is concerned about the bills of all of its customers, not
19 just those that participate in DSM programs, it believes that testing potential programs
20 under the RIM test is essential. If the Commission believes certain DSM programs are in
21 the public interest – but will cause upward pressure on rates – then the Commission should
22 ensure TEP will be able to timely recover the resulting increased expenditures in rates.

23
24 In order to establish a complete cost-benefit analysis, TEP has performed three cost-benefit
25 tests. As described above, TEP conducted the RIM test. In addition, TEP has performed
26 the TRC cost-benefit test, which measures the costs of a DSM program against the benefits
27 of the program as a supply-side option. TEP has also performed the requested SC test.

1 The SC test differs from the TRC test in two ways. First, TEP has replaced the utility
2 capital discount rate with a societal discount rate. Second, TEP has quantified the
3 environmental benefits that are expected to result from DSM measures installed in terms of
4 pounds of SOx, NOx, and CO2 and gallons of water saved.

5
6 **Q. Ms. Smith, what are the Company's overall DSM Portfolio goals and objectives?**

7 A. The Company always wants to make sure that its DSM proposals make sense for Arizona
8 consumers. This means that making programs cost-effective is a paramount goal. To that
9 end, the Company's DSM Portfolio goals and objectives provide a measured approach to
10 DSM by carefully considering, on a case-by-case basis, the availability and viability of
11 various technologies in Arizona, as well as the rate environment in which the Company
12 operates. It is only through this careful analysis that the Company and the Commission can
13 protect Arizona ratepayers from adverse rate impacts due to the implementation of DSM.
14 The Company believes that through well-reasoned implementation of cost-effective DSM,
15 the Company can remain committed to both improving the environment as well as
16 protecting ratepayers from unnecessary rate increases.

17
18 The Company believes in promoting cost-effective DSM for its customers. It has and will
19 continue to take an active role in educating customers about the available programs and the
20 positive impacts DSM measures, including energy efficiency, can have on customers'
21 electric bills. The Company and the Commission have heard from customers who want to
22 get more involved in energy efficiency. The Company certainly wants to provide those
23 customers with the information and the ability to do so. However, the Company and the
24 Commission have also heard from consumers who are concerned about the rising cost of
25 electricity. Therefore, the Company must consider how DSM decisions will ultimately
26 raise rates for customers. The interests of the environment and reasonable rates must be
27 weighed and to do so, customers must be given the information to make decisions for

1 themselves. In the end, the Company should promote, provide and implement cost-
2 effective DSM tariffs and programs.

3
4 **Q. Please identify the DSM programs that are included in TEP's proposed DSM**
5 **Portfolio.**

6 A. The Company proposes to include the following DSM programs which are described in
7 more detail below and in the attachments to the DSM Portfolio:

- 8 (i) Residential New Construction Program (Existing);
- 9 (ii) Low-Income Weatherization ("LIW") Program (Existing);
- 10 (iii) Shade Tree Program (Existing);
- 11 (iv) Education and Outreach Program (Existing);
- 12 (v) Direct Load Control ("DLC") Program (New);
- 13 (vi) Residential HVAC Replacement Program (New);
- 14 (vii) Compact Fluorescent Lamp ("CFL") Buydown Program (New);
- 15 (viii) Non-Residential Existing Facilities Program (New);
- 16 (ix) Efficient Commercial Building Design Program (New);
- 17 (x) Small Business DSM Program (New).

18
19 **Q. What is the estimated level of energy and capacity savings, utility costs, societal**
20 **benefits and costs, and other benefits of the DSM Portfolio as a whole?**

21 A. Below is a chart that details the DSM Portfolio budgets and estimated savings for the
22 period of 2008 through 2012. Additional information about the costs and benefits of the
23 individual DSM programs is provided in the DSM Portfolio attached to my Direct
24 Testimony as Exhibit DAS-1 and by this reference incorporated herein.

DSM Portfolio Budgets and Estimated Savings 2008-2012

Program Budget 2008-2012	Coincident Peak Demand Savings (MW)	Non- Coincident Peak Demand Savings (MW)	Annual MWH Savings	Annual Therm Savings
\$63,310,337	183.4	247.0	211,600	303,970

DSM Portfolio Net Benefits 2008-2012

TRC Test Portfolio Benefits	\$150,351,771
TRC Portfolio Costs	\$81,404,485
TRC Portfolio Net Benefits	\$68,947,286
SC Test Portfolio Benefits	\$184,213,285
SC Test Portfolio Costs	\$81,404,485
SC Test Portfolio Net Benefits	\$102,808,799

In addition, the DSM Portfolio provides other Environmental Benefits outlined below:

DSM Estimated Environmental Benefits 2008-2012

Program	Water Savings (Million Gallons)	Sox (Lbs)	Nox (Lbs)	CO2 (Million Lbs)
Education and Outreach	0.0	0	0	0.0
Direct Load Control	2.2	10,425	17,316	9.1
Residential Efficiency Programs				
Low-Income Weatherization	0.5	2,453	4,074	2.1
New Home Construction	21.4	102,434	170,151	89.5
Residential HVAC Retrofit	2.6	12,558	20,860	11.0
Shade Tree Program	0.6	2,956	4,910	2.6
CFL Buydown Program	26.0	124,311	206,492	108.6
Residential Subtotal	51.2	244,712	406,487	213.8

Non-Residential Efficiency Programs				
Non-Residential Existing Facilities Program	26.5	126,715	210,485	110.7
Small Business Program	17.9	85,433	141,912	74.6
Efficient Commercial Building Design	8.0	38,439	63,850	33.6
Non-Residential Subtotal	52.4	250,587	416,247	218.9
Total	105.8	505,723	840,051	441.8

Q. Please describe the marketing plans the Company will use to promote its DSM Portfolio.

A. The specifics of the marketing strategy are tailored to each program. However, marketing plans generally include a mix of internet, print media, radio, direct contact, direct mailings, bill inserts and presentations. The program descriptions attached to the DSM Portfolio more fully describe the proposed marketing approach for each program.

Q. Please describe the delivery plans, including implementation schedules, the Company anticipates for its DSM Portfolio.

A. TEP proposes that programs be implemented using a mix of both in-house and outside resources. Such a mix will enable TEP to take full advantage of experts who have implemented similar programs in other areas, while also using in-house resources where appropriate. For all programs, TEP will retain responsibility for program administration, measurement and evaluation, and reporting activities. TEP intends to issue Requests for Proposal ("RFPs") to qualified firms for all significant activities that will be outsourced. Assuming approval of this DSM Portfolio in the second quarter of 2008, TEP plans to implement new programs in the fourth quarter of 2008. Modification requested to existing programs can be implemented within sixty (60) days of approval.

1 **Q. How will the Company measure and evaluate the performance of its DSM Portfolio?**

2 A. In general, the Company intends to integrate data collection and tracking activities directly
3 into the program implementation process. TEP plans to use an independent third-party
4 evaluation contractor to conduct evaluations. Prior to program implementation, TEP will
5 select an evaluation contractor. The evaluation contractor will then work directly with
6 TEP, and any implementation contractors, to ensure that program design and
7 implementation activities will collect the necessary data for monitoring and evaluation.
8

9 **Q. Does TEP have other plans to improve the accuracy of monitoring and evaluating its
10 DSM programs?**

11 A. Yes. TEP will be seeking approval in a separate docket to conduct a baseline study in
12 conjunction with its proposed DSM Portfolio, consistent with the agreed-upon approach
13 for UNS Gas, Inc. ("UNS Gas") in its rate case docket. A baseline study is necessary to (i)
14 establish the current level of deployment and saturation of energy efficient technologies in
15 the market, (ii) assess the level of market penetration that each program may be able to
16 realize over time, (iii) identify opportunities for additional energy efficiency improvements,
17 and (iv) collect data on local market and technology characteristics to support future
18 program planning, evaluation and measurement activities. Examples of the kind of
19 information collected in a baseline study include non-residential and residential facility
20 types and characteristics (e.g., square footage, vintage), equipment types and
21 characteristics, saturation of energy system technologies, energy system operational
22 characteristics, and current practices of energy systems specifiers and designers.
23

24 **Q. How will TEP recover the costs of the proposed baseline study?**

25 A. Although TEP will be seeking approval to conduct a baseline study in a separate
26 proceeding, the Company is requesting the costs of the study be recovered in the DSM
27 Adjustor Mechanism.

1 **Q. Please describe how TEP will administer the programs.**

2 A. In general, TEP will use in-house resources for program administration. Most
3 administration activities will be handled by Program Managers who will oversee day-to-
4 day activities and reporting requirements. Program Managers will also oversee activities of
5 implementation contractors when applicable. Additional details about the administration
6 of the DSM programs are provided in the attachments to the DSM Portfolio, which is
7 Exhibit DAS-1.
8

9 **III. SPECIFIC PROGRAMS WITHIN THE DSM PORTFOLIO.**

10
11 **A. Current Programs to be Continued.**

12
13 **Q. What current DSM programs does the Company intend to continue?**

14 A. TEP is proposing to continue the following existing DSM programs:
15

16 First, the **Residential New Construction Program** or “GHP” is a DSM program designed
17 to utilize the most recent building-science research. It is an integrated systems approach to
18 designing and constructing highly energy efficient new homes that will reduce energy
19 requirements for their full 50+ year life expectancy. The GHP includes improved
20 construction standards and quality control steps that may include on-site inspections to
21 confirm products are installed properly, and testing to verify how the residence will
22 perform. Since the implementation of the GHP, numerous custom and production builders
23 have participated in the program, with thousands of homes already constructed under the
24 GHP and even more committed by contract to the GHP to-date. Changes to the program
25 include updated construction standards to acknowledge that minimum code requirements
26 have improved since 1999 and that Federal Energy Standard minimum equipment
27 efficiencies have changed. Results of new engineering studies and the cost benefit analysis

1 show that, on average, the GHP provides 1.06 kW coincident peak reduction, 1,370 of
2 cooling kWh reduction, 706 of heating kWh reduction, and 12 therm savings for each
3 home built to GHP standards. TEP is also offering increased incentives as an option to
4 builders who choose to use higher equipment efficiency standards. The GHP benefit cost
5 results show a TRC of 2.04, a SC of 2.63 and a RIM of 1.57. Attachment 4 to the DSM
6 Portfolio provides program-specific detail.

7
8 Second, TEP offers a **Low-Income Weatherization** or **LIW Program** administrated
9 through the Tucson Urban League and Pima County Community Services. TEP's funding
10 of the LIW Program allows agencies to leverage TEP funding with federal, state and local
11 funds to provide weatherization services to low-income customers. The main benefit of
12 the LIW Program is the reduction of gas and electric heating bills through reduced energy
13 consumption for these customers. Since 1991, approximately 1,700 low-income customers
14 have received weatherization services from TEP. Changes to the program include: (i)
15 increased funding to both agencies; (ii) an expanded list of weatherization measures
16 allowed in each home; (iii) increased maximum dollar spending limit on each home; (iv)
17 including CFLs, low-flow shower and faucet aerators, and hot-water heater blankets to be
18 installed in every low-income home that also qualifies for emergency repair or flood repair
19 funding; and (v) increased reporting functions so agencies must report each measure
20 installed in the homes. The new program will allow TEP to calculate and verify energy
21 and demand savings from the LIW Program and report those savings in future years.
22 Results of engineering analysis show that, on average, each home participating in the LIW
23 Program provides 0.371 kW non-coincident peak reduction, 619 summer kWh reduction,
24 495 winter kWh reduction and 68 therms saved. LIW benefit- cost results show TRC of
25 0.55, SC of 0.67 and RIM of 0.41. However, this analysis does not include the positive
26 and unquantifiable effects of leveraging federal and state funding for other improvements
27 to the homes which further reduce energy consumption and improve occupant comfort and

1 safety. TEP recognizes that this program does not meet the positive utility cost tests, but
2 believes that it is important for TEP to include efforts that assist low-income customers
3 with energy efficiency improvements. Attachment 3 to the DSM Portfolio provides more
4 program-specific details and by this reference is incorporated herein.

5
6 Third, TEP's **Shade Tree Program** administered through "Trees for Tucson", a program
7 offered through "Tucson Clean and Beautiful", promotes energy conservation and the
8 environmental benefits associated with planting low-water usage trees and other
9 vegetation. TEP's funding of the Shade Tree Program allows the agency to leverage TEP
10 funding with in-kind donations of labor and materials to provide shade trees to residential
11 customers, schools, and community projects. Desert-adapted trees have been provided to
12 residential neighborhoods, public areas and schools by TEP. Since 1992, TEP and its
13 partners have planted more than 53,000 trees. Changes to the Shade Tree Program include:
14 (i) increased funding levels to allow a greater number of trees to be planted in residential
15 neighborhoods, and (ii) expanded reporting detail provided by the agency to enable better
16 monitoring and evaluation of energy and demand savings. Results of engineering analysis
17 show that, on average, each Shade Tree provides a 109 kWh summer reduction. Shade
18 Tree benefit-cost results show TRC of 2.28, SC of 3.01 and RIM of 0.98. Attachment 6 to
19 the DSM Portfolio provides more program-specific details and by this reference is
20 incorporated herein.

21
22 Finally, our **Education and Outreach Program** provides online energy audit services to
23 our residential and small commercial customers, and general energy efficiency marketing
24 and education. Customers can complete audits of their homes or businesses, and receive
25 detailed reports on how to conserve energy and lower their utility bills. In addition, the
26 Education and Outreach Program includes funding for academic programs for school
27 grades K-12 and community projects such energy efficiency displays at the Tucson

1 Children's Museum. All segments of education have been designed to support DSM
2 programs and market transformation. Since this is a market transformation and a delivery
3 mechanism for the other DSM programs, a benefit-cost analysis was not completed on the
4 Education and Outreach Program. The changes to the Education and Outreach Program
5 include an increase in funding levels to allow for greater promotion of energy efficiency to
6 residential and small commercial customers through media, brochures, direct mailings and
7 bill inserts. We also propose an increase in funding for Academic Education to allow for a
8 greater number of in-class presentations and additional funding to educate consumers on
9 how to conserve energy on TOU Rates. Again, Attachment 1 to the DSM Portfolio
10 provides more program-specific details and by this reference is incorporated herein.

11
12 **Q. Has the Company provided additional information on these current DSM programs?**

13 A. Yes. The Company is providing the additional information requested by Staff in the 1999
14 Settlement Agreement Amendment Case in its program-specific attachments to the DSM
15 Portfolio, Exhibit DAS-1.

16
17 **B. Additional New DSM Programs.**

18
19 **Q. What new DSM programs is the Company proposing?**

20 A. The Company proposes to offer the following new DSM programs:

- 21 1) **DLC Program** – As discussed above, TEP is proposing the addition of a DLC
22 Program to its DSM Portfolio. Results of detailed benefit cost analysis show TRC
23 of 1.33, SC of 1.51 and RIM of 1.15. Attachment 2 to the DSM Portfolio provides
24 more program-specific details and by this reference is incorporated herein.
- 25 2) **Residential HVAC Retrofit Program** - This program will promote the installation
26 of high efficiency AC and heat pump systems in existing homes in TEP's service
27 region. For equipment replacements, the Program will promote the selection of

high efficiency equipment that exceeds the federal minimum efficiency standard of 13 SEER. Incentives for the purchase of qualifying high-efficiency equipment will be paid directly to homeowners. Any contractor may install or provide qualifying equipment to TEP customers. Results of engineering analysis show the Residential HVAC Retrofit Program provides a kW saving of .31 and a kWh savings of 907 annually. Residential HVAC Retrofit Program benefit cost results show TRC of 1.35, SC of 1.68 and RIM of 0.62. Attachment 5 to the DSM Portfolio provides more program-specific details and by this reference is incorporated herein.

3) **CFL Buydown Program** - This program will promote high-efficiency Environmental Protection Agency / Department of Energy ("DOE") Energy Star® approved lighting. The Program will negotiate discount pricing from CFL manufactures and retailers (up-stream buy-down), and provide for distribution of CFLs through local retailers. Customers will be referred to participating retailers to purchase qualifying products. Discount pricing will be passed on to consumers through a negotiated agreement with lighting manufactures and retailers. The Program also will provide sales training for participating retailers and consumer education, including in-store point-of-sale displays. This Program will be administered through an outside implementation contractor. Results of engineering analysis show that the CFL Buydown Program provides a kW savings of .038 and a 32 kWh annual savings on average (per lamp). CFL Buydown Program benefit cost results show TRC of 2.05, SC of 2.33 and RIM of 0.48. Attachment 7 to the DSM Portfolio provides more program-specific details and by this reference is incorporated herein.

4) **Non-Residential Existing Facilities Program** - The Non-Residential Existing Facilities Program will provide prescriptive incentives to owners and operators of non-residential facilities for energy-efficiency improvements in lighting, HVAC, motors, compressed air, and refrigeration measures. The Program will provide

1 custom incentives for implementation of energy-efficiency measures not covered by
2 the prescriptive measures. The Program also will provide technical assistance and
3 education for facility owners and operators. This Program will be administered
4 through an outside implementation contractor. Non-Residential Existing Facilities
5 Program benefit-cost results show TRC of 3.04, SC of 3.74 and RIM of 0.90.
6 Attachment 8 to the DSM Portfolio provides more program-specific details and by
7 this reference is incorporated herein.

8 **5) Efficient Commercial Building Design Program** - The Efficient Commercial
9 Building Design Program is a performance-based program that will include design
10 assistance, performance based incentives for the building owner/developer, and
11 energy design information resources. Design assistance will involve efforts to
12 integrate energy-efficiency into a customer's design process to influence
13 equipment/systems selection and specification as early in the design process as
14 possible. Design assistance will provide incentives to offset the additional design
15 cost of investigating alternative energy efficient designs. The performance-based
16 incentives for the building owner/developer are based on improved efficiency
17 compared to a baseline design and are computed by comparing the features of the
18 baseline design to those of the energy efficient alternatives using an hourly building
19 energy simulation program, such as DOE-2. Building energy analysis and
20 modeling will be provided by an outside pre-qualified design professional with
21 expertise in building energy simulation modeling. The Efficient Commercial
22 Building Design Program benefit cost results show TRC of 1.62, SC of 2.05 and
23 RIM of 1.08. Attachment 9 to the DSM Portfolio provides more program-specific
24 details and by this reference is incorporated herein.

25 **6) Small Business DSM Program** – DSM incentive programs have typically had
26 limited success reaching small business participants. This market segment
27 generally has limited access to investment capital, little or no knowledge of energy

1 cost savings opportunities, and requires a simple payback of one year or less before
2 it will participate. In order to successfully reach this market segment and encourage
3 small businesses to participate, the Company proposes to offer a direct installation
4 program.

5
6 In order to minimize the "hassle factor" for customers and encourage the market to provide
7 energy efficiency services to the small business market segment, this Program will be
8 operated as an "up-stream" market program and offer incentives directly to installing
9 contractors. In order to stimulate the market, incentives will be offered which are intended
10 to reduce the measure payback to one year or less, cover from 75 percent to 100 percent of
11 the installed cost of the measure, and provide a TRC cost effectiveness of one or more.

12
13 Eligible customers for the Small Business Program are customers that qualify for TEP's
14 rate 10 (typically an aggregate monthly demand of 200 kW or less). This criterion allows
15 the Program to focus resources on those customers with the greatest barriers to
16 participation.

17
18 The Program will offer incentives for a select group of retrofit and replace-on-burnout
19 energy efficiency measures in existing facilities. The efficiency measures offered by the
20 Small Business Program include high-efficiency lighting equipment upgrades, high-
21 efficiency HVAC equipment, lighting controls, programmable thermostats, and selected
22 refrigeration measures. The Small Business Program benefit cost results show TRC of
23 2.11, SC of 2.62 and RIM of .54. Attachment 10 to the DSM Portfolio provides more
24 program-specific details and by this reference is incorporated herein.

25
26
27

1 **C. DLC Program.**

2
3 **Q. In the 1999 Settlement Agreement Amendment Case, TEP proposed a DLC**
4 **Program. Does the Company still believe the DLC Program is an effective DSM**
5 **measure?**

6 A. Yes. Again, in 2006 the highest one percent of all load hours represented over 10 percent
7 of the annual peak hour demand, yet represented only 0.0775 percent of annual energy
8 consumption. When system demand and/or cost is very high, reserve margins and the
9 ability to economically service load can be low. This puts the ability of the system to
10 serve the load at risk, either due to economic considerations or in the event of an
11 unexpected generation or transmission outage. DLC programs represent a DSM element
12 with guaranteed demand reduction presenting the Company with an opportunity to
13 improve overall system reliability. The Company proposes to implement the DLC
14 Program to facilitate immediate and guaranteed load reduction in a controlled manner.

15
16 **Q. Please describe the proposed DLC Program.**

17 A. The DLC Program consists generally of a 50 percent cycling strategy of air conditioning
18 ("AC") equipment with a programmable thermostat. Through the DLC Program, the
19 Company is able to use a radio frequency signal to interrupt the cycle of the customer's
20 AC. The DLC Program will give customers the opportunity to agree to reduce their load.
21 The DLC Program target is to install approximately 100,000 AC and programmable
22 thermostat units by 2012. More information regarding the proposed DLC Program is
23 provided as Attachment 2 to the DSM Portfolio and by this reference incorporated herein.

24 **Q. Has the Company determined the most cost-effective means to implement the DLC**
25 **Program?**

26 A. While there are a number of vendors offering a DLC program for an annual fee, those
27 programs are not readily integrated into a utility Automatic Meter Reading / Advanced

1 Metering Infrastructure ("AMR/AMI") program, which is required as the basic
2 infrastructure for development of an ultimate "Smart Home" program. TEP recognizes,
3 but has not yet fully quantified, the range of benefits available from an AMR/AMI
4 infrastructure program, and certainly DLC can be a major beneficiary of an AMR/AMI
5 communications infrastructure. An AMR/AMI communications infrastructure could also
6 support future needs for time shift control of hybrid plug-in vehicle charging units and
7 output control of distributed generation and energy storage systems during wind and solar
8 intermittency events in order to mitigate the detrimental impact of those intermittencies on
9 grid reliability. After Commission approval of a DLC program, TEP will issue an RFP for
10 DLC services and will evaluate bids against the costs and benefits of an in-house DLC
11 implementation as part of an overall AMR/AMI infrastructure development program.
12

13 **Q. Will customers be required to participate in the DLC Programs?**

14 A. No. For those customers opting to participate, TEP will have the ability to cycle off the
15 customer's AC unit compressor while allowing for a customer to override the utility's
16 settings. Cycling could occur during the Company's shoulder and peak periods from May
17 through September. In addition to cycling during these time periods, cycling events may be
18 initiated or altered for reliability or economic reasons. However, bear in mind that 246
19 MW of guaranteed demand reductions are needed to reduce annual peak hour demand by at
20 least 10 percent. If the Company finds that a voluntary DLC Program does not achieve the
21 necessary load reduction, the Company will return to the Commission to request making
22 the DLC Program mandatory for customers.
23

24 **Q. Will all customers be eligible to participate in the DLC Program?**

25 A. Most residential and small commercial customers will be eligible to participate in the DLC
26 Program. However, TEP feels that it is prudent to exclude from the DLC Program those
27 commercial or residential facilities with customers or residents that are extremely heat

1 sensitive. For example, preschool and senior care facilities will not be eligible. In
2 addition, customers who do not have mechanical AC systems and customers with AC
3 systems that do not meet the electrical code may not participate.

4
5 While most residential and small commercial customers throughout the Company's service
6 territory will be eligible, the Company plans to conduct educational and outreach support
7 programs to target customers in identified constrained network areas. Focusing on these
8 constrained areas will help build and tap community-based support for the DLC Program.

9
10 **Q. When the DLC Program was proposed in the 1999 Settlement Agreement**
11 **Amendment Case, what response did the Company receive from Staff and**
12 **Intervenors?**

13 A. In general, parties sought additional information regarding the DLC Program. In response
14 to the requests by the Staff and Intervenors, the Company is providing more detailed
15 information this filing. That information is set forth in Attachment 2 to the proposed
16 DSM Portfolio (Exhibit DAS-1).

17
18 **IV. COST RECOVERY.**

19
20 **A. DSM Adjustor Mechanism.**

21
22 **Q. Please explain the Company's proposed DSM Adjustor Mechanism.**

23 A. The Company proposes an annually adjusted DSM Adjustor Mechanism to provide cost
24 recovery for Commission-approved DSM programs and expenditures. All DSM costs,
25 including those currently in base rates, will be put into the DSM Adjustor Mechanism for
26 recovery as a per-kWh line-item charge on customer bills. In addition, the Efficient
27 Equipment Enhanced Financial Incentive, discussed below, will be recovered through the

1 line item DSM Adjustor Mechanism. Finally, the DSM Performance Incentive, also
2 discussed below, would also be recovered through the DSM Adjustor Mechanism.

3
4 **Q. Have parties made any comments about the proposed DSM Adjustor Mechanism?**

5 A. In general, comments relative to the DSM Adjustor Mechanism in the 1999 Settlement
6 Agreement Amendment Case suggested that it should be approved by the Commission in
7 the context of a rate case. However, the Commission's order in Decision No. 69568
8 instructed the Company to file information on cost recovery in this proceeding.
9 Consequently, TEP witness Mr. Thomas Hansen is supporting the Company's request for a
10 DSM Adjustor Mechanism in the rate case. I am providing similar information regarding
11 the DSM Adjustor Mechanism in this proceeding.

12
13 In the 1999 Settlement Agreement Amendment Case, Commission Staff Witness Ms.
14 Barbara Keene requested additional information as to the operation of the DSM Adjustor
15 Mechanism. TEP has provided this information on an informal basis to Commission Staff
16 and I also am providing this information in my testimony. In UNS Gas' rate case hearing
17 (Docket No. G-04204A-06-0463), Staff Witness Ms. Julie McNeely-Kirwan testified in
18 favor of a similar DSM adjustor mechanism.

19
20 **Q. Please provide more information about the DSM Adjustor Mechanism and how it**
21 **works.**

22 A. The DSM Adjustor Mechanism is a per-kWh line-item charge that will appear on
23 customers' bills and compensate the Company for its participation in the encouragement
24 and implementation of DSM programs. Where a customer has a tiered rate, the DSM
25 Adjustor Mechanism rate will also be tiered as described in more detail below. Where a
26 customer has a flat energy-consumption rate, the basic DSM Adjustor Mechanism rate will
27 also be a flat amount per kWh of all energy consumed per month, again, as described in

1 more detail below. It is the Company's intention that no DSM program costs will be
2 included in its base rates, but rather will be recovered through the DSM Adjustor
3 Mechanism.

4
5 The Company will annually submit actual DSM program cost and program performance
6 information in a DSM Adjustor Mechanism filing for the year prior. The filing will
7 include an estimate of next-year revenue requirements information for the DSM program
8 offerings. The DSM Adjustor Mechanism rate would then be calculated by:

- 9 • First determining the difference between DSM program revenues received in the
10 prior year through the DSM Adjustor Mechanism and the actual DSM program
11 costs for the prior year;
- 12 • Adding the forecast DSM program costs for the next year;
- 13 • Adding the revenue to be recovered from the DSM Performance Incentive
14 Mechanism;
- 15 • Adding the revenue to be recovered from the Efficiency Enhanced Financial
16 Incentive;
- 17 • This sum is then divided by the appropriate tiered and flat forecast annual electric
18 sales for the next year after the DSM program effects are considered;
- 19 • The result would be the rate per kWh to be used for the next year's DSM Adjustor
20 Mechanism.

21
22 Please see Exhibits DAS-2, DAS-3, DAS-4 and DAS-5 to my Direct Testimony for
23 calculation details and an example calculation.

24
25 **Q. What is the purpose of the DSM Adjustor Mechanism?**

26 A. The DSM Adjustor Mechanism will allow for timely recovery of DSM-approved costs that
27 the Company incurs with regard to successful implementation of energy efficiency and

1 demand reduction programs. It will also provide a mechanism by which the Commission,
2 as well as the Company's customers, can readily identify those expenses associated with
3 energy efficiency and demand reduction.
4

5 **Q. TEP proposed three "methodologies" in its rate case filing – the Market**
6 **Methodology, the Cost-of-Service Methodology and the Hybrid Methodology. Is**
7 **TEP's proposed DSM cost recovery the same under each of the Methodologies?**

8 A. Yes. DSM cost recovery is independent of the rate method ultimately deemed appropriate,
9 as all expenses associated with DSM will be recovered through the DSM Adjustor
10 Mechanism.
11

12 **Q. What programs and related costs will be included in the DSM Adjustor Mechanism?**

13 A. The DSM Adjustor Mechanism will recover all costs related to specific DSM programs,
14 the Efficiency Enhanced Financial Incentive, and the DSM Performance Incentive,
15 described below. Specific DSM program costs include program design, development and
16 implementation, in addition to marketing, advertising, program management, outside
17 implementation contractors, measurement and evaluation, and general and administrative
18 overhead. The DSM Adjustor Mechanism will also recover costs of developing a DSM
19 Customer Information System ("CIS") over the five years subsequent to implementation of
20 the CIS system. Marketing costs include education and outreach programs. The DSM
21 Adjustor Mechanism will also recover any DSM incentive payments made directly to
22 customers or equipment vendors. In addition, the marketing baseline study is appropriately
23 recovered through the DSM Adjustor Mechanism.
24

25 **Q. Are there any DSM costs that will not be recovered through the DSM Adjustor**
26 **Mechanism?**

27 A. It is the Company's intention to move all costs to implement energy efficiency and demand

1 reduction from base rates into the DSM Adjustor Mechanism. However, to the extent that
2 DSM-related renewable energy program costs fall within the Renewable Energy Standard
3 and Tariff ("REST") rules, A.A.C. 14-2-1801 *et seq.*, those costs should be recovered
4 through the tariff TEP files with the Commission pursuant to the REST rules. An example
5 would be commercial daylighting which is normally considered as a DSM program, but is
6 specifically noted as qualifying for incentives in the REST rules.

7
8 **Q. Which costs will initially be placed into the DSM Adjustor Mechanism?**

9 A. Again, the DSM Adjustor Mechanism will initially be set based on the Commission-
10 approved annual expenditures in this Docket and the total Company adjusted test-year
11 kWhs. Similar to what was agreed upon in UNS Gas' rate case by Commission Staff and
12 UNS Gas, TEP requests that 25 percent of expected new program expenses and 100
13 percent of existing program costs will be included in the initial DSM Adjustor Mechanism.
14 Costs related to the baseline study would be included in the DSM Adjustor Mechanism in
15 its second year.

16
17 In addition, in TEP's last rate case, the Commission approved an annual expenditure of
18 \$3.1 million for DSM. A portion of the \$3.1 million, \$2.25 million, was diverted to fund
19 the Environmental Portfolio Standard ("EPS"). TEP proposes that the money currently
20 diverted to the EPS return to funding DSM and that the entire DSM expenditure amount be
21 removed from base rates. All DSM expenditures will then flow through the DSM Adjustor
22 Mechanism. In the first DSM program year there would be no DSM Performance
23 Incentive to be recovered, as that would be based upon actual DSM program performance
24 in the prior year.

1 **Q. Ms. Smith, please provide additional detail regarding the dollar amounts that the**
2 **Company proposes to transfer from base rates to the DSM Adjustor Mechanism?**

3 **A.** At this time, the Company proposes an initial annual funding of \$12.4 million for the
4 proposed DSM programs, including \$4 million that will be removed from base rates in the
5 Company's rate case. The allocation of the funding by program is listed below:

Program	1st Full Year DSM Program Costs
Residential New Construction	\$ 3,200,000
Shade Tree	\$ 160,000
Low-Income Weatherization	\$ 381,000
Education and Outreach	\$ 651,000
Residential HVAC Replacement	\$ 500,000
Efficient Commercial Building Design	\$ 800,000
Non-residential Existing Facilities	\$ 700,000
Compact Fluorescent Lamp Buydown	\$ 700,000
Small Business DSM	\$ 1,300,000
Direct Load Control	\$ 3,970,500
Total of DSM Programs	\$ 12,362,500

19
20 **Q. Previously you referred to a portion of the DSM funding that was diverted to the EPS**
21 **that the Company proposes to return to funding DSM and recovered through the**
22 **DSM Adjustor Mechanism. Can you please elaborate?**

23 **A.** Yes. As part of the funding for the EPS, in 2000, the Commission authorized TEP to use
24 increasing amounts of System Benefit Charge ("SBC") revenues originally allocated to
25 DSM program funding for renewable energy program funding. Those funds totaled \$2.25
26 million in the test year. If TEP's REST funding tariff is approved for 2008, TEP will no
27 longer need to use SBC revenues for renewable energy programs. Because the REST will

1 replace the EPS, and the REST will provide all revenue recovery for the renewable energy
2 programs as part of the REST, there will not be a need to continue funding the EPS through
3 the SBC or EPS surcharge. This would also apply if TEP's compliance plan, which will be
4 filed in a separate docket pursuant to, and within the timeframe specified by, the REST
5 rules, is approved by the Commission.
6

7 **Q. When will the DSM Adjustor Mechanism begin operation and how does the**
8 **Company propose to transition costs to the new DSM Adjustor Mechanism?**

9 A. The DSM Adjustor Mechanism could begin operation when the Commission issues an
10 order approving the mechanism. In the Company's rate case, the removal of the DSM-
11 related funds in the SBC portion of the base rates will likely occur, and expenses normally
12 supported by such funds will thereafter be supported through the DSM Adjustor
13 Mechanism. Given the fixed estimated nature of the DSM Adjustor Mechanism, each
14 subsequent annual review of the DSM Adjustor Mechanism will true up actual expenses
15 against estimated expenses.
16

17 **Q. How will the DSM Adjustor Mechanism be reset?**

18 A. After its first year in operation, the DSM Adjustor Mechanism will be modified based on:
19 (i) historic and projected DSM funding and customer collections, (ii) the Efficiency
20 Enhanced Financial Incentive and (iii) the DSM Performance Incentive. No later than June
21 1st of each year, the Company will file a request with the Commission, with supporting
22 documentation, to revise its DSM Adjustor Mechanism for the following year. Exhibits
23 DAS-2, DAS-3, DAS-4 and DAS-5 to my Direct Testimony show the calculation of the
24 proposed DSM Adjustor Mechanism for the first year after receiving an order in this
25 proceeding.
26
27

1 **Q. How does the Company propose to bill the new DSM Adjustor Mechanism to**
2 **customers?**

3 A. A DSM Adjustor charge will appear as a separate line item on customers' bills. Exhibit
4 DAS-3 to my Direct Testimony shows the proposed tariff for the DSM Adjustor
5 Mechanism. Where a customer has a tiered rate, the DSM Adjustor Mechanism rate will
6 also be tiered, in that a zero DSM Adjustor Mechanism rate is charged on the first tier of
7 500 kWh of monthly consumption. For second-tier monthly energy consumption (over 500
8 kWh but less than 3,500 kWh for residential -- Rates 01, 21, 70, 201 -- and less than
9 55,000 kWh for commercial -- Rates 10, 76), the basic calculated DSM Adjustor
10 Mechanism rate would be charged. For third-tier monthly energy consumption (over 3,500
11 kWh for residential and over 55,000 kWh for commercial), three times the basic (tier two)
12 DSM Adjustor Mechanism rate calculated would be charged. All other customers will be
13 charged the second-tier rate times all energy consumed per month.

14
15 **Q. What is the proposed DSM Adjustor Charge in the first year of implementation?**

16 A. Following the methodology used in the UNS Gas rate case, TEP proposes to collect, in the
17 first year DSM Adjustor Mechanism, 100% of the existing program budgets and 25% of
18 the new program budgets for a total of \$6,384,625 (see the table below). Using adjusted
19 test-year kWh, the proposed second-tier DSM Adjustor Mechanism rate in the first year of
20 implementation is \$0.000625/kWh and the third-tier rate is \$0.001875 (see Exhibits DAS-3
21 and DAS-5 to my Direct Testimony). As all customers benefit financially from reductions
22 in energy consumption and demand through the DSM programs, all customer classes
23 should be required to support those programs financially.

PROGRAM	1st full Year DSM Program Costs	Proposed 1st Year DSM Adjustor Mechanism Collections
Residential New Construction (existing)	\$ 3,200,000	\$ 3,200,000
Shade Tree (existing)	\$ 160,000	\$ 160,000
LIW (existing)	\$ 381,000	\$ 381,000
Education and Outreach (existing)	\$ 651,000	\$ 651,000
Residential HVAC Replacement (new)	\$ 500,000	\$ 125,000
Efficient Commercial Building Design (new)	\$ 800,000	\$ 200,000
Non-residential Existing Facilities (new)	\$ 700,000	\$ 175,000
Compact Fluorescent Lamp Buydown (new)	\$ 700,000	\$ 175,000
Small Business DSM program (new)	\$1,300,000	\$ 325,000
Direct Load Control program (new)	\$3,970,500	\$ 992,625
Total Proposed 1st year collection		\$6,384,625

Q. Should the DSM Adjustor Mechanism have a sunset date?

A. No. The DSM Adjustor Mechanism should be in effect as long as expenses of DSM programs are to be recovered. At this time the Company does not foresee a time when DSM programs would not be offered.

Q. Is the Company proposing to have the DSM Adjustor Mechanism account accrue interest?

A. No, interest will not be accrued on the DSM accounts. The use of the annual true-up should provide a balance between over recovery some years with under recovery some years.

1 **Q. How will the DSM Adjustor Mechanism be recorded on TEP's books?**

2 A. All labor and non-labor costs associated with each of the approved DSM programs will be
3 recorded in specific Accounting Project Codes. These costs will be subject to balance
4 sheet tracking and put into a deferral account on TEP's books. The DSM program cost
5 will be recorded in accordance with Generally Accepted Accounting Principles and the
6 Federal Energy Regulatory Commission's Uniform System of Accounts.

7
8 **Q. Have you provided a proposed calculation methodology and example calculation for**
9 **the DSM Adjustor Mechanism?**

10 A. Yes; Exhibits DAS-2, DAS-3, DAS-4 and DAS-5 to my Direct Testimony show the
11 proposed calculation methodology and example calculation for the DSM Adjustor
12 Mechanism.

13
14 **B. Efficiency Enhanced Financial Incentive.**

15
16 **Q. Please explain the Company's proposed Efficiency Enhanced Financial Incentive for**
17 **certain high energy efficiency expenditures.**

18 A. In order to provide economic incentives to the Company for certain high energy-efficient
19 capital expenditures, the Company proposes the Efficiency Enhanced Financial Incentive
20 mechanism that will allow TEP to earn an additional five-percent return, one percent for
21 each of five consecutive years, on its capitalized DSM expenses than it would claim on
22 "normal" utility property. More specifically, the Company would be permitted to earn five
23 percent more on the total dollar value of high efficiency equipment investment as
24 compared to the total return on a non-high energy-efficient investment.

1 **Q. What type of energy efficiency expenditures would be eligible for the higher rate of**
2 **return?**

3 A. Expenditures eligible for this higher return would include:

- 4 • Equipment upgrades made to TEP-owned transmission or distribution system
5 components, such as a line upgrade with a higher efficiency conductor, a
6 transformer with high-efficiency windings, lighting upgrades in a power plant,
7 high-efficiency motor upgrade on pumps, or higher efficiency capacitors in the
8 distribution system; and
- 9 • Assets that TEP may not own but are: (i) installed at customer premises in TEP's
10 service territory; (ii) are financially supported by investments TEP makes outside of
11 the DSM programs; and (iii) are properly recovered through customer payments,
12 such as an investment in the form of a financial incentive in a thermal storage
13 system, a high efficiency motor replacement, a lighting retrofit, or internal
14 transformer upgrade. The incentive would be applied to one-time agreements with
15 customers for a specific equipment upgrade or replacement, or for internal
16 equipment upgrades and replacements whose costs are recovered over a multiple
17 year period of time.

18
19 The high-efficiency equipment would have to provide at least 15 percent lower losses in
20 the case of transmission or distribution equipment, or 15 percent better energy utilization in
21 the case of energy conversion equipment, than similar equipment that would perform the
22 same function in the most cost effective manner without an enhanced financial incentive.
23 The installed cost of the high efficiency equipment shall not exceed 120 percent of the
24 installed cost of similar equipment that would perform the same function in the most cost-
25 effective manner without an enhanced financial incentive.

1 For example, if the Company purchased a new high-efficiency 500 kV distribution
2 transformer with 0.85 percent losses and a premium cost of 15 percent (\$11,500) over a
3 standard efficiency unit with 1.1 percent losses and a cost of \$10,000, the investment in the
4 transformer (\$11,500) would be eligible for the five percent enhanced financial incentive.
5 In this example, TEP would recover an additional \$115 per year in the DSM Adjustor
6 Mechanism for five consecutive years after the transformer is operational and in service.
7

8 **Q. How would the proposed Efficiency Enhanced Financial Incentive rate operate?**

9 A. No less than 30 days before making an expected expenditure or investment that the
10 Company believes is appropriately recovered under the Efficiency Enhanced Financial
11 Incentive rate, the Company will make a filing before the Commission. After Commission
12 review, the Company would proceed to purchase and install the equipment or make the
13 investment with the expectation that it will be permitted to recover for that equipment or
14 investment under the Efficiency Enhanced Financial Incentive rate through the DSM
15 Adjustor Mechanism. The installed costs of the high-efficiency equipment would also be
16 recorded in normal plant asset accounting records and applied to rate base at the next rate
17 case, just as any other asset placed in service between rate cases.
18

19 **Q. Have you provided a proposed rate calculation for the Efficiency Enhanced Financial**
20 **Incentive rate?**

21 A. Yes; attached to my Direct Testimony, as Exhibit DAS-6, is the proposed Efficiency
22 Enhanced Financial Incentive rate calculation methodology and example calculation, which
23 by this reference is incorporated herein.
24

25 **Q. Are you aware of any states that have approved an incentive mechanism similar to**
26 **what you propose?**

27 A. Yes. The State of Nevada has an incentive mechanism that allows for recovery above the

1 authorized return on equity for the costs of conservation and DSM programs. This
2 incentive mechanism includes utility purchases of energy-efficient equipment for utility
3 service purposes.

4
5 **C. DSM Performance Incentive.**

6
7 **Q. Please explain the purpose of a DSM performance incentive.**

8 A. The intended result of successful energy efficiency programs is the reduction of electric
9 energy consumption and/or electric demand. While this reduces the costs of producing
10 electrical energy for an electric utility, it also reduces the revenue derived from energy
11 consumption based rates and reduces the opportunity for the utility to earn a return on
12 assets. These intended results are mitigated by the implementation of a performance
13 incentive which allows the customers and the Company to share the overall net benefits of
14 the DSM Portfolio. To that end, TEP proposes the Performance Incentive that would allow
15 customers to receive 90 percent and the Company to receive up to 10 percent of the net
16 benefits of the DSM Portfolio, excluding the LIW and the Educational and Outreach
17 Programs. The DSM Performance Incentive calculation also would not include the DLC
18 Program benefits as those are primarily capacity-related, not consumption-related.

19
20 **Q. How would TEP's proposed DSM Performance Incentive operate?**

21 A. Each year TEP would file with the Commission the actual net DSM Portfolio benefits
22 (program benefits minus the program costs) as verified through the measurement and
23 evaluation process. The net benefits will be calculated each reporting period and will be
24 included in the next annual true-up of TEP's DSM Adjustor Mechanism. Ten percent of
25 the sum of the program's net benefits will be calculated. This is an after-tax DSM
26 Performance Incentive. The DLC, LIW and the Education and Outreach programs are
27 outside the scope of the DSM Performance Incentive and will not be considered with the

1 net benefits or the incentive cap. After the total DSM Portfolio's net benefits are summed,
2 a ten percent cap (of period spending) will be applied to determine the maximum amount
3 of the DSM Performance Incentive. During the first year, DSM programs would most
4 likely produce reduced or negative net benefits. Therefore, the DSM Performance
5 Incentive would start after the first full year of implementation – giving time for programs
6 to ramp up and reach their potential.

7
8 **Q. Are you aware of any precedent for such a Performance Incentive?**

9 A. Yes. This Commission is considering approving a similar performance incentive
10 mechanism for Arizona Public Service Company. In addition, TEP's DSM program
11 consultants have provided information that similar mechanisms have been approved in
12 Connecticut, Massachusetts, Minnesota, Ontario and Vermont. Several of these
13 jurisdictions, including Connecticut, Ontario, Massachusetts and Vermont, allow for lost
14 revenue recovery and California allows for a mechanism to decouple profits from sales to
15 address the inherent disincentive for a utility using consumption-based rates to offer
16 energy-efficiency programs.

17
18 **Q. Have you provided a proposed rate calculation for the DSM Performance Incentive?**

19 A. Yes. Attached hereto as Exhibit DAS-7 is a description and example of the DSM
20 Performance Incentive, which by this reference is incorporated herein.

21
22 **V. ENERGY EFFICIENCY STANDARD ("EES").**

23
24 **Q. What is an EES?**

25 A. An EES is a goal for reducing annual MWhs by a predetermined percentage based on a
26 forward projection of a utility's consumption over time.

1 **Q. Ms. Smith, has the Company considered proposing an EES?**

2 A. Yes. In the 1999 Settlement Agreement Amendment Case, Mr. Jeff Schlegel of the
3 Southwest Energy Efficiency Project ("SWEEP") advocated an EES. SWEEP would
4 require TEP to: "(1) achieve energy savings equal to at least 5% of total energy resources
5 needed to meet retail load in 2010, and at least 15% in 2020; and (2) reduce summer peak
6 demand by at least 5% of total capacity resources needed to meet retail peak demand in
7 2010, and at least 15% in 2020." While the Company disagrees with the cost-benefit
8 analysis provided by SWEEP, it has considered the implementation of an EES. The
9 Company believes that an EES could work for Arizona so long as accurate and predictable
10 baseline growth forecasts are made. This could then be used as the basis for determining
11 utility performance in relation to the EES goals and provide guaranteed cost recovery.

12
13 **Q. Does the Company propose an EES?**

14 A. Not at this time. Currently, the average Utilization Per Customer ("UPC") is increasing
15 due to the convergence of entertainment and computer electronics coupled with sharp price
16 reductions in high energy consuming large screen entertainment systems and a trend in
17 Tucson to improve summer comfort by converting from evaporative cooling to air-
18 conditioning, making it very difficult to set an accurate and predictable baseline growth
19 forecast. As energy intensive industries relocate to Arizona in general, and to the Tucson
20 area specifically, energy consumption per customer also increases in an unpredictable
21 manner. Evaluation of utility performance to meet the goals of an EES requires predictable
22 energy growth forecasts, but both UPC and customer growth patterns are not easily
23 predictable at this time. Additionally, increasing demand for commercially available plug-
24 in hybrid vehicles during the expected implementation period of an EES further complicate
25 evaluation of utility DSM program performance against an EES baseline. Utility
26 performance in meeting an EES goal is entirely dependant upon utility customers
27 embracing their own purchases of energy efficient appliances, light bulbs and other energy

1 consuming equipment or shifting fuel sources and changing their energy use habits. While
2 DSM programs can provide customers with tools to reduce their energy consumption,
3 customers can not be forced to change their habits.
4

5 **Q. Are SWEEP's goals reasonable?**

6 A. No. First, Mr. Schlegel does not propose any method of setting an accurate and predictable
7 baseline growth forecast, making evaluation of EES compliance an impossible task.
8 Second, in that proceeding, SWEEP provided no specific testimony stating any
9 assumptions to support his EES goals.
10

11 **Q. Given that an EES is difficult to accurately administer, are there other means by
12 which Utility DSM program success can be measured?**

13 A. Yes, given that targets have already been proposed to reduce energy consumption as a
14 component of greenhouse gas ("GHG") reduction programs, a link can easily be made
15 between utility energy efficiency goals and the reductions in GHG through energy
16 efficiency programs.
17

18 **Q. Can you give an example of a DSM goal that is based on GHG reductions?**

19 A. Yes. The American Solar Energy Society ("ASES") published its proposal for energy
20 programs it recommends are needed to meet a national US goal of reducing GHG releases
21 to levels appropriate to meet a maximum global CO₂ concentration range. The ASES
22 report concludes that realistic energy efficiency measures could be implemented to hold US
23 GHG releases essentially flat through 2030. Of those energy efficiency measures, 0.63
24 Quads (1 Quad = 10¹⁵ British Thermal units of Heat Energy) of energy savings would be
25 created through utility-based financial incentive DSM programs by the year 2020,
26 representing about 5.5 percent of the total savings required to keep the GHG releases flat
27 through 2020.

1 **Q. Is the energy savings proposed by TEP's DSM Portfolio sufficient to achieve the**
2 **proposed annual levels recommended by the ASES?**

3 A. Yes. Using as a base the TEP 2006 retail sales of 9,201,419 MWh, and historic energy
4 sales growth of 3.59 percent, we applied the recommended 5.5 percent load growth
5 reduction recommended by ASES for utility-based financial incentive DSM programs.
6 The calculation results in a reduction of 0.1975 percent of 2006 annual energy sales per
7 year for TEP. This means for TEP to meet the ASES goal, 18,168 MWh saved annually or
8 a total of 97,602 MWh by 2012. In 2012, after five years of the proposed TEP DSM
9 Portfolio, resulting energy sales reductions are projected to be 211,600 MWh. Thus, the
10 DSM Portfolio will exceed the rate of energy reductions expected by the ASES GHG
11 management goals from utility-based financial incentive DSM programs by a factor of two.
12

13 **Q. Is such a reduction appropriate?**

14 A. Again, yes. TEP has analyzed a full-range of DSM programs and is proposing only DSM
15 measures which are cost effective. Thus, the DSM Portfolio as a whole will cost
16 effectively reduce energy consumption even if those reductions are greater than the level
17 needed for TEP customers to collectively achieve reductions needed to meet the proposed
18 ASES energy efficiency goals.
19

20 **VI. CONCLUSION.**
21

22 **Q. Ms. Smith, do you have any concluding remarks?**

23 A. Yes. Through this filing, the Company has responded to questions and comments from
24 Commission Staff and interested parties on its current DSM programs. It has provided
25 extensive information both about its proposed DSM Portfolio, and the specific programs
26 within that Portfolio, and cost recovery for such.
27

1 The Company believes that its DSM Portfolio contains a variety of DSM program offerings
2 that have been completely evaluated and selected because of their suitability for TEP
3 customers. As fossil fuel primary energy sources become more expensive and the
4 environmental imprint of energy use will be increasingly regulated, utilities can reduce
5 cost-of-service by partnering with customers to employ more renewable generation as well
6 as reducing energy consumption and peak annual energy demand. The Company looks
7 forward to the Commission approving its proposed DSM Portfolio to accelerate the
8 building of energy saving partnerships between TEP and its customers.
9

10 **Q. Does this conclude your testimony?**

11 **A. Yes.**
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EXHIBIT

DAS-1

Tucson Electric Power Company
Demand-Side Management
Program Portfolio Plan
2008-2012

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Attachments:

Education and Outreach Program Description	Attachment 1
Direct Load Control Program Description.....	Attachment 2
Low-Income Weatherization Program Description.....	Attachment 3
New Home Program Description (Residential New Construction).....	Attachment 4
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1. Introduction

Tucson Electric Power Company ("TEP") is requesting approval of the portfolio of DSM programs presented in this Demand-Side Management ("DSM") Program Portfolio Plan for 2008 through 2012 ("DSM Portfolio"). This DSM Portfolio provides an overview of DSM programs that TEP proposes to implement to provide savings and net benefits for TEP customers.

2. DSM Portfolio Performance Costs, Savings and Net Benefits

TEP proposes to implement its DSM Portfolio, designed to reduce the use of energy by encouraging its customers to implement certain energy-efficiency products, services or practices, and help TEP manage peak loads through the implementation of a Direct Load Control ("DLC") Program. The proposed programs are designed to influence residential and non-residential customers to adopt energy efficiency measures through a combination of rebates, technical assistance and training, and consumer education.

Exhibit 1 below summarizes the proposed budget and expected energy and demand savings as a result of program activities from 2008-2012¹. Exhibit 2 below summarizes program net benefits from 2008-2012 from the perspectives of the Total Resource Cost ("TRC") and the Societal Cost ("SC") tests. These tests are described in more detail below.

Exhibit 1
DSM Portfolio Budgets and Estimated Savings 2008-2012

Program Budget 2008-2012	Coincident Peak Demand Savings (MW)	Non- coincident Peak Demand Savings (MW)	Annual MWH Savings	Annual Therm Savings
\$63,310,337	183.4	247.0	211,600	303,970

The total budget represents TEP's best estimate of spending, however, it is inevitable that some programs will achieve greater participation than others. DSM costs will be recovered through an adjuster mechanism approved by the Arizona Corporation Commission ("Commission") and actual spending will be trued-up after each full year. Therefore, TEP suggests that the proposed annual budgets should not represent a maximum annual spending limit and that flexibility is approved for TEP to adjust spending for programs achieving greater participation than expected. Budgets may need to be adjusted annually to maximize the effectiveness of the overall DSM Portfolio.

¹ Both the coincident and non-coincident demand savings include a 107.8 MW reduction attributable to the proposed Direct Load Control Program. Base load reductions attributable to DSM activities are estimated to be 139.1 MW non-coincident and 75.6 MW coincident peak.

Exhibit 2
DSM Portfolio Net Benefits 2008-2012

Total Resource Cost Test Portfolio Benefits	\$150,351,771
Total Resource Cost Portfolio Costs	\$81,404,485
Total Resource Cost Portfolio Net Benefits	\$68,947,286
Societal Cost Test Portfolio Benefits	\$184,213,285
Societal Cost Test Portfolio Costs	\$81,404,485
Societal Cost Test Portfolio Net Benefits	\$102,808,799
Total Resource Cost Test – Portfolio Level	1.85
Total Societal Cost Test – Portfolio Level	2.26

Total Net Benefits are equal to Total Societal Benefits minus Total Societal Costs. Total Societal Benefits are equal to the avoided costs of demand and energy savings over the life of the efficiency measures, and Total Societal Costs include all program costs, including the costs of program administration, measurement, evaluation and research².

The DSM adjustor mechanism will recover costs of development and implementation of a DSM customer information tracking system, capitalized over 5 years subsequent to implementation of the tracking system. TEP's current, high-level estimate for this tracking system is \$1.5 million.

3. Description of Proposed Programs

The DSM Portfolio includes a range of programs designed to provide all TEP customer segments with opportunities to reduce demand, save energy and reduce energy costs. The programs are designed to provide options for improving the energy efficiency of residential existing homes, residential new construction projects, residential low-income homes, non-residential existing facilities, and non-residential new construction and renovation projects.

While this document provides cost and benefit information for a five-year program portfolio plan, it is important to note that this does not mean programs will be eliminated at the end of the first five years. Through regular monitoring and evaluation of each program, TEP will determine if programs are cost effective. Individual programs may be modified or eliminated at a date earlier than 5 years or they may continue for additional years until each individual program is no longer cost-effective.

This section includes a brief description of each proposed DSM program. Detailed program descriptions are provided in the Attachments hereto including information about (1) program concepts; (2) target markets; (3) baseline conditions; (4) customer eligibility; (5) program rationales; (6) program objectives; (7) products and services provided; (8) delivery strategy and administration; (9) marketing and communications; (10) implementation schedules; (11) monitoring and evaluation plans; (12) program costs; (13) estimated energy savings; and (14) program cost effectiveness. Exhibit 3 below lists the programs included in this DSM Portfolio:

² The total resource costs and societal costs include \$1,500,000 in customer tracking database costs expected to be incurred in 2008.

Exhibit 3

Listing of Programs Included in the DSM Portfolio

Education and Outreach Program
Direct Load Control Program
Residential Efficiency Programs
Low-Income Weatherization
New Home Program
Residential HVAC Retrofit
Shade Tree Program
CFL Buydown
Non-Residential Efficiency Programs
Non-Residential Existing Facilities
Small Business Program
Efficient Commercial Building Design

3.1 Education and Outreach Program

The Education and Outreach Program includes initiatives specifically formulated for TEP's residential and non-residential customers.

Residential Education and Outreach

TEP currently provides on-line energy audit services to residential customers. The Energy Advisor ("EA") is a highly interactive, graphical home energy analysis application that is easy to use and understand. The EA can generate more than 140 energy savings recommendations or measures and is personalized for weather and electric utility rates based on the customer's zip code. A user can complete the audit with or without an electric bill history download. TEP's on-line energy tools are designed to help customers understand and manage their energy use and include a Detailed Home Energy Analysis and Energy Savings Calculators. TEP's residential Education and Outreach Program also includes an energy efficiency media campaign to educate customers on how to conserve energy, as well as energy education initiatives formulated for academic institutions. The campaign includes bill inserts, radio advertising, and home page icons on TEP's website. This DSM Portfolio proposes to continue the Program in its current configuration. TEP expects that this Program will serve as a conduit to the proposed CFL Buydown, Guarantee Home, Shade Tree and Residential HVAC Retrofit Programs. The Education and Outreach Program also includes education for residential customers on Time-of-Use ("TOU") rates.

Non-Residential Education and Outreach

This DSM Portfolio proposes to continue the EA Program in its current configuration as on-line audit services with the goal of educating TEP small commercial consumers on how to conserve energy and lower their utility bills. The Education and Outreach Program also includes education for non-residential customers on TOU rates and energy education initiatives formulated for academic institutions. TEP expects that this Program will serve as a conduit to the proposed Existing Facilities, Small Commercial and Efficient Commercial Building Design incentive Programs.

The changes to the Education and Outreach Program include an increase in funding levels to allow for greater promotion of energy efficiency to residential and small commercial customers through media, brochures, direct mailings and bill inserts. TEP is also proposing an increase in funding for Academic

education to allow for a greater number of in-class presentations and additional funding to educate consumers on how to conserve energy on TOU Rates

For a detailed description of the Education and Outreach Program, see Attachment 1.

3.2 Direct Load Control Program

This proposed program is to provide TEP with the capacity for direct load control of residential and small commercial central air conditioning equipment using communicating thermostat technology. The DLC Program may be delivered in-house or if necessary, through a third-party implementation contractor. A DLC implementation option being considered is through integration with an in-house Automatic Meter Reading / Advanced Meter Infrastructure ("AMR/AMI") program. TEP hopes to install DLC on 10,000 air conditioning units during the first year of implementation and ramp up participation to an estimated 100,000 units within 10 years. TEP's ultimate goal is to have up to 246 MW of load shedding capacity from the residential and small-mid size commercial component of the DLC system. For a detailed description of the DLC Program, see Attachment 2.

3.3 Residential Efficiency Programs

Proposed residential efficiency programs to be included in the DSM Portfolio are described below.

Low-Income Weatherization Program

This DSM Portfolio proposes an expansion and modification of the current Low-Income Weatherization ("LIW") Program. The Program will continue to provide qualifying residential low-income customers with funding assistance for the installation of measures that improve the energy-efficiency of their homes. However, the new Program will offer an expanded set of efficiency measures and services. TEP has not formally tracked program activities in the past but will develop a tracking system for the new Program to quantify measures installed, energy savings realized, and report on Program achievements.

Changes to the LIW Program include: (1) increased funding to participating agencies; (2) an expanded list of weatherization measures allowed in each home; (3) an increased spending limit on each home; (4) inclusion of compact fluorescent lighting ("CFL"), low-flow shower and faucet aerators and water heater insulation wraps to be installed in every low-income home that also qualifies for emergency repair or flood repair funding; and (5) an increase in the reporting functions so agencies must report each measure installed in the homes. The new program will allow TEP to calculate and verify energy and demand savings from the LIW program and report those savings in future years. However, this analysis does not include the positive and unquantifiable effects of leveraging federal and state funding for other improvements to the homes which further reduce energy consumption and improve occupant comfort and safety. For a detailed description of the LIW Program, see Attachment 3.

New Home Program

The Guarantee Home Program ("GHP"), also referred to as the Residential New Construction Program, requirements are designed to utilize the most recent building science research and promote a system approach to designing and constructing new homes. The GHP requires in-field performance testing of homes to assure that homes are performing to specification and provides both energy cost and comfort guarantees. To encourage participation, the GHP offers incentives for builders who meet program standards. The Program also offers training and technical assistance for builders and subcontractors about the benefits and features of energy efficient homes. This DSM Portfolio proposes to modify the GHP to include updated standards that account for changes in local energy codes, include updated energy and demand savings and high-efficiency equipment options. For a detailed description of the New Home/Residential New Construction Program, see Attachment 4.

Residential HVAC Retrofit Program

The Residential HVAC Retrofit Program promotes the installation of high-efficiency residential HVAC equipment by providing incentives to homeowners for equipment that meets minimum qualifying efficiency requirements. For a detailed description of the Residential HVAC Retrofit Program, see Attachment 5.

Shade Tree Program

The purpose of the Shade Tree Program is to promote energy conservation and environmental benefits associated with planting low-water usage trees and other vegetation. Desert-adapted trees have been provided to residential neighborhoods, low-income families, public areas, and schools by TEP. The trees at residential sites are located on the south, west and east sides of home in the TEP service area with the objective of providing summer shading, reducing cooling loads and reducing customer cooling energy costs on the TEP system. TEP has not formally tracked Program activities in the past but will develop a tracking system for the new Program. TEP will quantify measures installed, energy savings realized, and report on Program achievements. TEP is also proposing to increase funding to allow a greater number of trees to be planted in neighborhoods. For a detailed description of the Shade Tree Program, see Attachment 6.

Compact Fluorescent Lamp Buydown Program

TEP's original desire was to develop a program to promote high-efficiency EPA/DOE Energy Star® appliances and lighting products. However, advice from TEP's consultant that benefit-cost analysis completed by other utilities in the Southwest has shown that the incremental cost versus benefit from Energy Star® appliances does not provide a positive TRC. Rather than duplicating the cost and effort to conduct a separate analysis for the appliance section of this Program, TEP chose to limit the Program to lighting products that produce a positive TRC. This Program therefore promotes high-efficiency EPA/DOE Energy Star® approved lighting. The Program will negotiate discount pricing from CFL manufactures and retailers (up-stream buy-down), and provide for distribution of CFLs through local retailers. Customers will be referred to participating retailers to purchase qualifying products. Discount pricing will be passed on to consumers through a negotiated agreement with lighting manufactures and retailers. The Program provides sales training for participating retailers and consumer education, including in-store, point-of-sale displays. For a detailed description of the CFL Buydown Program, see Attachment 7.

3.4 Non-Residential Efficiency Programs

Proposed non-residential efficiency programs to be included in the DSM Portfolio are described below:

Non-Residential Existing Facilities Program

The Non-Residential Existing Facilities Program provides prescriptive incentives to owners and operators of non-residential facilities for energy-efficiency improvements in lighting, HVAC, motors, compressed air and refrigeration measures. The Program will provide custom incentives for implementation of energy-efficiency measures not covered by the prescriptive measures. The Program also provides technical assistance and education for facility owners and operators. For a detailed description of the Non-Residential Existing Facilities Program, see Attachment 8.

Efficient Commercial Building Design Program

The Efficient Commercial Building Design Program is a performance based program that includes design assistance for the design team, performance based incentives for the building owner/developer, and energy design information resources. Design assistance involves efforts to integrate energy-efficiency into a customer's design process to influence equipment/systems selection and specification as early in the design process as possible. Design assistance provides incentives to offset the additional design cost of

investigating alternative energy efficient designs. The performance based incentives for the building owner/developer are based on improved efficiency compared to a baseline design and are computed by comparing the features of the baseline design to those of the energy efficient alternatives using an hourly building energy simulation program, such as DOE-2. Building energy analysis and modeling will most likely be provided by a pre-qualified design professional with expertise in building energy simulation modeling. Energy design resources include design guides, technical resources, and modeling tools to facilitate the comparison of alternative designs. For a detailed description of the Efficient Commercial Building Design Program, see Attachment 9.

Small Business Program

DSM incentive programs have typically had limited success reaching small business participants. This market segment generally has limited access to investment capital, little or no knowledge of energy cost savings opportunities, and, in general, requires a simple payback of one year or less before they will participate. In order to successfully reach this market segment and encourage small businesses to participate, the Company proposes to offer a direct installation program for lighting, HVAC, and Refrigeration measures. The Program will be operated as an "up-stream" market program and offer incentives directly to installing contractors. Eligible customers are those who qualify for TEP's pricing plan, Rate 10 – Small General Service, (typically an aggregate monthly demand of 200 kW or less). The proposed Program will focus on reducing known barriers in this market and provide the incentives and delivery mechanisms to encourage participation in the Program. For a detailed description of the Small Business Program, see Attachment 10.

4. Budget

TEP is proposing to spend \$63.3 million dollars on energy-efficiency DSM programs during program years 2008-2012³. The proposed division of funds between residential and non-residential customers is approximately commensurate with the relative contribution to the DSM funds from these customer classes.

The proposed budget maximizes the amount of program funds that go directly to customers through rebates and incentives, training and technical assistance, and consumer education. This DSM Portfolio also takes into account the realities of DSM program start-up costs and funds needed to adequately plan, develop, deliver, and evaluate quality programs. It typically takes two years or more to ramp up programs and achieve significant customer participation levels and program savings, and the DSM Portfolio accounts for program ramp-up costs over the 2008-2009 time period. Over the ramp up period through 2009, TEP expects that a total of 55% to 60% of the program costs (depending on the program) will benefit customers directly in the form of incentives, training or education. Once the program has reached maturity, TEP expects that a total of up to 65% to 70% of program costs will go directly to customers. The balance of budget expenditures will be applied to program administration. Program administration expenses include all non-incentive expenses, including TEP internal staff expenses, marketing and communications expenses, implementation contractor fees and expenses, measurement, evaluation and research, and other direct expenses attributable to the programs.

Incentive levels and other program elements will be reviewed and modified as needed during the first year from the approval date of this DSM Portfolio, and periodically thereafter. Such modifications will be reported in the mid-year and year-end reports submitted to Commission Staff.

³ This does not include \$1.5 million in customer tracking database development costs expected to be allocated to the TEP portfolio in 2008.

For the purposes of presenting the proposed budgets for this DSM Portfolio, the program budgets have been broken into the following categories:

- **Rebates and Incentives** – Funds that go toward customer rebates and incentives, and installation of measures (e.g., low-income weatherization measures).
- **Training & Technical Assistance** – Funds that are used for energy-efficiency training and technical assistance.
- **Consumer Education** – Funds that are used to support general consumer education about the benefits of energy-efficient improvements and load management options.
- **Program Implementation** – Program delivery costs associated with implementing the program, including implementation of contractor labor and overhead costs as well as other direct program delivery costs.
- **Program Marketing** – Includes all expenses related to marketing the program and increasing DSM consumer awareness and participation.
- **Planning & Administration** – Costs related to planning, developing and administering the programs, including management of program budgets, oversight of implementation contractors, program coordination and general overhead expenses.
- **Measurement, Evaluation, and Research** – Program expenses related to conducting measurement and evaluation of savings attributable to the program and program operational efficiency, as well as related research activities.
-

Exhibit 4 below shows a summary roll-up of the anticipated budgets for each program by cost category for program years 2008-2012. Exhibit 5 presents the total annual budget for each program over the planning period from 2008-2012. Detailed annual budgets for each program year are included in the Attachments. These budgets represent TEP's best estimate of spending, however, it is inevitable that some programs will achieve greater participation than others. DSM costs will be recovered through an adjuster mechanism approved by the Commission and actual spending will be trued-up after each full year. Therefore, TEP suggests that the proposed annual budgets should not represent a maximum annual spending limit and that flexibility is approved for TEP to adjust spending for programs achieving greater participation than expected. Program budgets may need to be adjusted annually to maximize the effectiveness of the overall DSM Portfolio.

Exhibit 4

2008-2012 DSM Portfolio Budgets by Cost Category

Program	Total Administrative and O&M Cost Allocation	Total Marketing Allocation	Total Direct Implementation	Total EM&V Cost Allocation	Total Cost
Education and Outreach	\$242,910	\$98,670	\$2,456,320	\$57,100	\$2,855,000
Direct Load Control	\$1,033,616	\$771,033	\$16,669,007	\$200,000	\$18,673,657
Residential Efficiency Programs					
Low-Income Weatherization	\$128,878	\$0	\$1,821,414	\$32,447	\$1,982,739
New Home Construction	\$2,300,339	\$2,130,590	\$12,778,673	\$552,795	\$17,762,397
Residential HVAC Retrofit	\$345,094	\$318,548	\$1,911,289	\$79,637	\$2,654,568
Shade Tree Program	\$80,000	\$0	\$700,000	\$20,000	\$800,000
CFL Buydown Program	\$297,312	\$445,967	\$2,824,460	\$148,656	\$3,716,395
Residential Subtotal	\$3,151,622	\$2,895,106	\$20,035,837	\$833,535	\$26,916,100
Non-Residential Efficiency Programs					
Non-Residential Existing Facilities Program	\$668,951	\$445,967	\$2,415,657	\$185,820	\$3,716,395
Small Business Program	\$1,171,687	\$634,169	\$4,820,311	\$275,710	\$6,901,877
Efficient Commercial Building Design	\$764,516	\$339,785	\$3,015,589	\$127,419	\$4,247,309
Non-Residential Subtotal	\$2,605,154	\$1,419,921	\$10,251,557	\$588,949	\$14,865,580
Total	\$7,033,303	\$5,184,730	\$49,412,721	\$1,679,584	\$63,310,337

Exhibit 5

2008-2012 DSM Portfolio Budgets by Year

Program	2008	2009	2010	2011	2012	Total Cost
Education and Outreach	\$651,000	\$551,000	\$551,000	\$551,000	\$551,000	\$2,855,000
Direct Load Control	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437	\$18,673,657
Residential Efficiency Programs						
Low-Income Weatherization	\$381,000	\$388,620	\$396,392	\$404,320	\$412,407	\$1,982,739
New Home Construction	\$3,200,000	\$3,644,072	\$3,663,824	\$3,649,415	\$3,605,086	\$17,762,397
Residential HVAC Retrofit	\$500,000	\$515,000	\$530,450	\$546,364	\$562,754	\$2,654,568
Shade Tree Program	\$160,000	\$160,000	\$160,000	\$160,000	\$160,000	\$800,000
CFL Buydown Program	\$700,000	\$721,000	\$742,630	\$764,909	\$787,856	\$3,716,395
Residential Subtotal	\$4,941,000	\$5,428,692	\$5,493,297	\$5,525,007	\$5,528,103	\$26,916,100
Non-Residential Efficiency Programs						
Non-Residential Existing Facilities Program	\$700,000	\$721,000	\$742,630	\$764,909	\$787,856	\$3,716,395
Small Business Program	\$1,300,000	\$1,339,000	\$1,379,170	\$1,420,545	\$1,463,161	\$6,901,877
Existing Facilities Program	\$800,000	\$824,000	\$848,720	\$874,182	\$900,407	\$4,247,309
Non-Residential Subtotal	\$2,800,000	\$2,884,000	\$2,970,520	\$3,059,636	\$3,151,425	\$14,865,580
Total	\$12,362,500	\$12,200,882	\$12,575,722	\$12,923,268	\$13,247,965	\$63,310,337

5. Program Energy Savings and Benefits

TEP has estimated the energy savings, costs, net benefits, and environmental benefits associated with each of the programs included in the proposed DSM Portfolio. The following sections describe the energy savings, cost-effectiveness, and environmental benefits that are expected to accrue from the programs.

5.1 Portfolio Energy Savings, Costs and Net Benefits

In preparing this DSM Portfolio, TEP examined a wide range of energy efficiency and load management measures that are applicable to all major energy end uses and provide a broad set of energy savings opportunities in all of TEP's customer sectors. The analysis included a detailed demand and energy savings and a cost effectiveness analysis of each measure, as well as each program as a whole. In order to complete the analysis, TEP assembled data on baseline and energy efficient performance of each measure technology as well as a range of other technical and financial data including:

- TEP avoided cost data;
- Discount rates;
- Effective Useful Lifetimes ("EUL") for each measure;
- Incremental and installed measure costs for each measure; and
- Projected participation rates for each program over the projected program life presented in this DSM Portfolio.

For the analysis of net program benefits, TEP has used avoided cost savings that will result from the expected energy savings and peak demand reductions generated by each DSM program in the proposed DSM Portfolio for measures implemented from 2008-2012. Levelized avoided cost data for a 20-year planning horizon was developed for use in the cost effectiveness analysis. TEP has evaluated the cost effectiveness of each measure and each program as a whole using the Ratepayer Impact Measure ("RIM") test, the TRC test, and the SC test. The SC test is a variant of the TRC test and differs from the TRC test by including the valuation of environmental benefits, non-energy benefits, and other societal benefits in the analysis. The SC test also uses a societal discount rate whereas the TRC uses a market discount rate. For the analysis of the portfolio of programs, TEP quantified the expected environmental benefits resulting from measures installed through the program, although they were not monetized for the purposes of cost-effectiveness testing. A societal discount rate of 5% was used in the computations of the SC test.

Exhibit 6 provides estimates of the expected lifetime energy savings and peak demand savings for each proposed DSM program and a summary of the net benefits. The lifetime energy savings are the estimated savings that will result over the expected lifetime of all program measures.

In addition to the estimated savings and benefits shown in Exhibit 6, the DSM Portfolio is anticipated to produce other societal benefits. Exhibit 7 shows an estimate of the water savings and air emission reductions that are expected as a result of the implementation of the measures promoted by the programs. Significant additional benefits which are expected to accrue to TEP customers include increased levels of service, non-energy benefits such as increased comfort, and support for low-income households.

Exhibit 6
Electric Savings and Benefits
2008-2012 Programs

Program	Non-Coincident Capacity Savings (MW)	Coincident Capacity Savings (MW)	Energy Savings (MWh)	Program Budget (\$000)	Societal Benefits (\$000)	Societal Costs (\$000)	Net Benefits (\$000)
Education and Outreach	0.0	0.0	0	\$2,855	\$0	\$0	\$0
Direct Load Control	134.8	134.8	4,362	\$18,674	\$28,448	\$18,674	\$9,775
Residential Efficiency Programs							
Low Income Weatherization	0.3	0.1	1,026	\$1,983	\$1,321	\$1,983	-\$661
New Home Construction	28.4	21.9	42,859	\$17,762	\$71,207	\$27,092	\$44,115
Residential HVAC Retrofit	1.8	1.8	5,254	\$2,655	\$5,367	\$3,192	\$2,176
Shade Tree Program	0.0	0.0	1,237	\$800	\$2,997	\$997	\$2,001
CFL Buydown Program	60.9	6.1	52,013	\$3,716	\$15,238	\$6,546	\$8,692
Residential Subtotal	91.5	29.8	102,390	\$26,916	\$96,130	\$39,808	\$56,322
Non-Residential Efficiency Programs							
Non-Residential Existing Facilities Program	10.1	8.8	53,019	\$3,716	\$25,023	\$6,699	\$18,325
Small Business Program	7.2	6.5	35,746	\$6,902	\$20,229	\$7,719	\$12,510
Efficient Commercial Building Design	3.5	3.5	16,083	\$4,247	\$14,382	\$7,005	\$7,377
Non-Residential Subtotal	20.7	18.8	104,848	\$14,866	\$59,634	\$21,422	\$38,212
Total	247.0	183.4	211,600	\$63,310	\$184,213	\$79,904	\$104,309

In addition to the electric savings and benefits, additional energy savings resulting from programs in the program portfolio include 303,970 therms of natural gas. The Residential New Home Construction Program reduces gas energy consumption by 241,506 therms and the LIW Program reduces gas energy consumption by 62,465 therms from 2009 through 2012.

Exhibit 7

DSM Benefit Cost Test 2008-2012 Programs

Program	Total Resource Cost Test	Societal Cost Test	Rate Payer Impact Measure Test
Education and Outreach	NA	NA	NA
Direct Load Control	1.33	1.51	1.15
Residential Efficiency Programs			
Low-Income Weatherization	0.55	0.67	0.41
New Home Construction	2.04	2.63	1.57
Residential HVAC Retrofit	1.35	1.68	0.62
Shade Tree Program	2.28	3.01	0.98
CFL Buydown Program	2.05	2.33	0.48
Non-Residential Efficiency Programs			
Existing Facilities Program	3.04	3.74	0.90
Small Business Program	2.11	2.62	0.54
Efficient Commercial Building Design	1.62	2.05	1.08

5.2 Environmental Benefits

In preparing this DSM Portfolio, TEP has estimated the environmental benefits expected to result from measures installed as a result of the portfolio of DSM programs. Based on the direction of Commission Staff, TEP is reporting environmental benefits in this DSM Portfolio but has not monetized the benefits for the purposes of cost effectiveness analysis of measures and programs. The environmental reductions are based on the kWh savings of all program measures over their expected useful lifetimes. For all measures that result in customer water savings, the calculation includes both customer and utility water savings.

The factors that are used to calculate the DSM Environmental Benefits are shown in Exhibit 8. In calculating these factors, TEP has identified the generation mix that is most likely to be displaced by the measures included in the DSM Portfolio.

Exhibit 8

Environmental Benefits Factors

Environmental Factor	Value	Units
SOx	2.39	lbs/MWh
NOx	3.97	lbs/MWh
CO2	2,088	lbs/MWh
Water	500	gals/MWh (utility water savings only)

Exhibit 9 shows the estimated water consumption and air emissions savings that will result over the expected lifetime of all measures installed as a result of the proposed DSM Portfolio.

Exhibit 9
DSM Estimated Environmental Benefits
2008-2012 Programs

Program	Water Savings (Million Gallons)	Sox (Lbs)	Nox (Lbs)	CO2 (Million Lbs)
Education and Outreach	0.0	0	0	0.0
Direct Load Control	2.2	10,425	17,316	9.1
Residential Efficiency Programs				
Low-Income Weatherization	0.5	2,453	4,074	2.1
New Home Construction	21.4	102,434	170,151	89.5
Residential HVAC Retrofit	2.6	12,558	20,860	11.0
Shade Tree Program	0.6	2,956	4,910	2.6
CFL Buydown Program	26.0	124,311	206,492	108.6
Residential Subtotal	51.2	244,712	406,487	213.8
Non-Residential Efficiency Programs				
Non-Residential Existing Facilities Program	26.5	126,715	210,485	110.7
Small Business Program	17.9	85,433	141,912	74.6
Efficient Commercial Building Design	8.0	38,439	63,850	33.6
Non-Residential Subtotal	52.4	250,587	416,247	218.9
Total	105.8	505,723	840,051	441.8

For all measures that result in customer water savings, the calculation of water savings shown in Exhibit 9 includes both customer and utility water savings.

6. Program Marketing and Delivery

This section of the DSM Portfolio presents TEP's proposed marketing and communications strategy, and implementation/delivery plan.

6.1 Program Marketing and Communications

This DSM Portfolio includes targeted marketing and communication of program offerings and benefits to encourage participation among customers, key market players and trade allies. The objective of the marketing and communications strategy is to make customers and key market actors aware of the program offerings and benefits, and to influence their decision-making at the time of purchasing or installing energy systems or equipment in favor of choosing more energy efficient options.

The specifics of the marketing strategy depend on the program, but generally include a mix of internet, print media, radio, direct contact, direct mailings, bill inserts and presentations depending on the market to be reached. The program descriptions in the Attachments describe the proposed marketing approach for each program.

6.2 Program Delivery and Implementation

TEP proposes that programs be implemented using a mix of both in-house and outsourced recourses. This enables TEP to take advantage of outsourced experts who have implemented similar programs in other areas,

while also using in-house resources where appropriate. For all programs, TEP will retain responsibility for program administration, measurement and evaluation, and reporting activities. TEP intends to issue Requests for Proposals ("RFP") to qualified firms for all significant activities that will be outsourced.

Exhibit 10 provides a timeline that shows key dates and program implementation activities. For a detailed description of the proposed implementation schedule and plans for in-house versus outsourced implementation models for each individual program, see the program descriptions included in the Attachments.

Exhibit 10 Program Development and Implementation Timeline 2008-2012

Tasks	2007				2008				2009			
	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Qtr 1	Qtr 2	Qtr 3	Qtr 4
Program Planning & Development												
Submit Portfolio Plan												
ACC Review & Approval												
Issue Contractor RFP's												
Program Marketing & Communication Planning												
Ongoing Education Programs Implementation												
Ongoing New Home Program Implementation												
Ongoing Shade Tree Program Implementation												
Ongoing LIW Implementation												
CFL Buydown Program Kick-Off												
Select DLC vendor (equipment)												
Select IC and MER Contractors												
DLC Full-scale Launch and Implementation												
NR Existing Facilities Program Launch and Implementation												
Efficient Commercial Building Launch and Implementation												
Small Commercial Program Launch and Implementation												
Program Impact and Process Evaluation												
Submit Updated Portfolio Plan (Biennial Submittal)												

7. Program Measurement, Evaluation and Research

Measurement, evaluation and research ("MER") is an integral component of the proposed DSM Portfolio. TEP will select a MER contractor at the same time it selects outsourced implementation services. TEP will adopt an integrated evaluation strategy for MER activities. This strategy saves program costs and produces better results by collecting data directly at the time measures are installed. Integrating data

collection into program delivery also requires that any implementation contractors engaged by TEP work with the MER contractor, to provide the data necessary to support evaluation activities. MER activities are expected to include:

- Verification that energy-efficiency measures are installed as expected;
- In-field measure performance measurement and data collection;
- Impact analysis to compute the savings that are being achieved;
- Cost-effectiveness analysis;
- Process evaluation to indicate how well programs are working to achieve objectives; and
- Research activities to identify additional opportunities for cost-effective energy-efficiency measures.

In general, the approach for MER will be to integrate data collection and tracking activities directly into the program implementation process. TEP intends to use an independent third-party evaluation contractor to conduct evaluations. Prior to program implementation, TEP will issue an RFP to retain an evaluation contractor. The evaluation contractor will then work directly with TEP and any implementation contractors to ensure that program design and implementation activities will collect the necessary data for MER.

TEP anticipates that evaluation activities will be ongoing during each year of program delivery, providing feedback on program performance and providing information to guide program course correction. TEP also expects that an impact and process evaluation report will be prepared at the end of each program year from 2008 through 2012.

For more information about the MER plan for each proposed DSM program, see the program descriptions in the Attachments.

Attachment 1

Education and Outreach Program

Attachment 1

Education and Outreach Program

Education and Outreach Program

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TEP Education and Outreach Program

Program Concept and Description

Tucson Electric Power Company ("TEP" or the "Company") understands that to meet performance guidelines for energy and demand reduction, the concept of energy efficiency and demand response must be supported and embraced by its customers. Messages that communicate the general concept of Demand-Side Management ("DSM") and the importance of energy efficiency to the customer should be included in many areas of communication. This education and outreach is intended to help customers understand and embrace the concept of DSM to encourage higher levels of participation in DSM programs offered by TEP. Education and outreach is the most important step in any market transformation effort.

Education and Outreach includes four distinct education strategies:

Residential Education:

The goal of residential education is to educate TEP's residential consumers on how to conserve energy and lower their electric utility bills. This is accomplished in a variety of ways discussed later in this report. The on-line energy audit portion of this strategy was approved by Arizona Corporation Commission Staff ("ACC Staff") in August 1992.

Academic Education:

The goal of academic education is to educate school children, provide early understanding and appreciation for energy efficiency, and to encourage students to take the information home. TEP offers several school education programs that cover a variety of topics related to energy, natural resource conservation and environmental awareness. These programs are currently targeted to students in grades K-8. Four of TEP's school education programs, described below, have been approved by the ACC Staff; all have been updated as situations have changed.

Commercial Education:

The goal of commercial education is to educate TEP's small commercial customers on how to conserve energy and lower their electric utility bills. This is accomplished through the on-line energy audit program. The program was approved in June 1994.

Time-Of-Use ("TOU") Education

The goal of TOU education is to teach TEP's residential and commercial customers about the benefits of TOU rates and communicate strategies that enable customers to maximize savings through load shifting. This TOU education is also intended to further customers' understanding of the mandatory TOU rate requirement.

Target Market and Program Eligibility

Each of the four strategies will be targeted to different customer groups, but in total, the Education and Outreach Program will be targeted to approximately 358,000 residential customers, 34,000 commercial customers, and 30,000-40,000 future consumers (students).

Education and Outreach Program

Current Baseline Conditions

In general, customers are not well educated on energy efficiency strategies and how different strategies might help reduce energy consumption in their home or business. Customers are also not well educated on the potential benefits from energy conservation in reducing greenhouse emissions and water use. The purpose of the four strategies included in the Education and Outreach Program is to help communicate and educate these messages to all customers. The messages included in these general energy efficiency campaigns will support individual DSM program messages.

Program Rationale

As an approved DSM program, the Education and Outreach Program has the potential to deliver messaging that will result in energy and demand reductions. This program also supports individual DSM program marketing and advertising efforts. To achieve energy and demand reduction goals from the DSM Portfolio of programs, the customer must hear similar and supporting messages through many avenues of communication. The Education and Outreach Program provides the opportunity for all utility customer segments to hear supporting messages and become more knowledgeable about energy use and energy cost saving opportunities in their homes and businesses. The Academic Education strategy offered to schools will lead to more aware energy consumers in the coming generation.

It is impossible to track the effectiveness, level of participation or demand and energy reduction created by educational and outreach programs. Utilities and regulatory agencies throughout the country recognize this limitation but understand the importance of the process.

Program Objectives

The program's goal is to educate consumers on ways to conserve energy, lower their electric utility bills, achieve cost effective energy savings, and reduce peak demand. The Education and Outreach Program is intended to help customers understand and embrace the concept of DSM to encourage higher levels of participation in DSM programs offered by TEP. Further, the goal is to generate awareness among tomorrow's consumers about the value of energy and the need to conserve it for a better future for all.

Products and Services Provided

Residential Education:

The Residential Education Strategy utilizes multiple methods to attain the goal of educating TEP's residential consumers on how to conserve energy and lower their electric utility bills.

On-line Energy Advisor

TEP provides on-line energy audit services to residential customers. The Residential Energy Advisor ("Energy Advisor") is a highly interactive, graphical home energy analysis application that is easy to use and understand. The Energy Advisor can generate more than 140 energy saving recommendations or measures and is personalized for weather and electric utility rates based on the customer's zip code. A user can complete the audit with or without an electric bill history download. TEP's on-line suite of energy tools to help a customer understand and manage energy

Education and Outreach Program

use includes a Detailed Home Energy Analysis and Energy Saving Calculators. Advertising and promotion for the Energy Advisor began in June 2006 and promotion included an electric bill insert, Web advertising, radio advertising and home page icons on TEP's Web site.

Customer Education

An energy efficiency media campaign designed to educate customers on simple low-cost conservation steps is produced annually. The campaign typically includes an electric bill insert, radio advertising and home page icons on TEP's Web site.

TEP and the Tucson Children's Museum ("Museum") partnered in 2004 to create an Energy Efficiency Awareness Program for children at the Museum. The Energy Efficiency hands-on exhibit at the Museum is for children (K-3) and was completed in May 2005. By experiencing hands-on activities with energy savings at an early age, the door is open to learn more, to change behaviors and to influence others. This valuable effort will be continued in future years.

Academic Education:

Insulation Station (4th Grade)

This concept was pre-approved by the ACC Staff in March 1993. The Insulation Station is a hands-on learning kit containing ready-to-assemble model houses and the necessary supplies to conduct science and math activities on insulation and home energy efficiency. Materials provided include model home kits and student workbooks containing charts, graphs, activities and a home energy audit. TEP requires 4th grade teachers to attend a training session prior to receiving materials. Once teachers have received training, they are eligible to receive materials every school year.

Growing Greener Cities (Middle School)

While the books, Growing Greener Cities, are out of print and no longer distributed, a representative from Trees for Tucson visits schools and talks to students about the value of trees to the environment and our community, and how shade trees can help conserve energy. Each participating school receives one or more desert-adapted trees planted on the campus, and student workshops focus on tree care and the environmental impact of trees. This on-going education regarding shade trees is actually funded from the TEP Shade Tree Program.

Energy Patrol (K – 12th Grades)

The Energy Patrol is an Arizona Energy Office-sponsored program. The concept was pre-approved by the ACC Staff in March 1993, after which TEP introduced it to 5th and 6th grade teachers and students. Students monitor classrooms to ensure that lights, computers and water faucets are turned off when rooms are vacant. The program is designed to help schools reduce electrical and water consumption costs and to teach students about energy conservation. Energy Patrol participation has decreased in the last few years as economics and legislation has deterred schools from offering incentives for conservation. Interest continues with numerous inquiries, however, getting permission at the proper levels takes time and few new schools have reported in with their results. Several Tucson Unified School District ("TUSD") schools received cash awards for energy saving efforts. Schools with an Energy Patrol earn additional points for their efforts, and most of the schools that actually reduce their energy use do so with the help of an Energy Patrol.

Commercial Education:

The on-line audit and individual communications with existing commercial customers are the primary avenues used for commercial education.

Education and Outreach Program

Account Managers

Account Managers work independently with larger Rate 13 and Rate 85 commercial customers on energy efficiency and high bill solutions, and members of the Customer Services Department who specialize in commercial high-bill applications work independently with Rate 10 small commercial customers on energy concerns.

On-line Energy Audits

TEP provides on-line energy audit services to Rate 10 small commercial customers. The Business Energy Advisor is a highly interactive, graphical application that is easy to use and understand. Small commercial customers can quickly find a case study relevant to their business type, perform a benchmark analysis comparing their facility to similar facilities, obtain a complete energy analysis, and get personalized recommendations for managing energy costs.

Advertising and promotion for the Energy Advisor began in June 2005 and typically includes a bill insert, Web advertising, radio advertising and home page icons on TEP's Web site.

Time-Of-Use Education:

TEP will notify current TOU customers about the changes to the program and also provide on-going information to new service customers and TEP customers interested in signing up for TOU. See the Marketing and Communications section of this report for more detail.

Delivery Strategy and Administration

This program will be administered in-house by TEP employees. TEP will provide program administration, marketing, planning, and consumer education activities.

Marketing and Communications

Residential and Commercial Education:

TEP will communicate and educate residential and commercial customers through a variety of avenues:

- **Bill messages** will be used to provide information to current customers;
- **Tep.com** will display information during the summer months to help Web users quickly find the energy savings information;
- **TEP customer care representatives** will be trained to answer any customer questions and they will know where to direct customers on tep.com;
- **Brochures** will be created to be mailed on demand. These will be distributed through the call center and tep.com and will be available for various public awareness events (school training, presentations, seminars, etc);
- **Inserts** will be added to customer bills to educate them on ways to help lower their electric bill costs;
- **Email newsletter** article featuring energy savings tips will be sent to all registered tep.com users;
- **Metro, traffic and radio** advertising will be used as appropriate to further communicate the value of the programs;
- **Media relations** will be prepared to answer questions posed by the media; and

Education and Outreach Program

- **Personal outreach** at fairs, exhibits, science competitions, etc. to distribute information, flyers, etc., about energy conservation and renewable energy.

Academic Education:

TEP contacts elementary and high school teachers by mail or individual telephone contact to schedule appearances. In addition, direct mail to all elementary schools outlines the programs offered and provides opportunities for teachers to order classroom sets of grade-appropriate energy conservation booklets and study guides for students grades K-6.

Time-Of-Use Education:

TEP will notify current TOU customers about the changes to the program and also provide on-going information to new service customers and TEP customers interested in signing up for TOU through avenues such as:

- **Targeted mailing** to educate current TOU customers on the new TOU program, including, how and when the changes will occur. It will also provide tips on maximizing the new program. (see Appendix 1 for customer numbers by rate and movement to new TOU tariff);
- **Bill messages** used to provide information to current TOU customers;
- **Tep.com** which will display information that will address both the current TOU users and those signing up for New Service. We will also provide the option to sign up for the service online;
- **TEP customer care representatives** trained to answer any customer questions regarding TOU. They will also inform new service customers of the change;
- **Brochures** created to be mailed on demand. These will be distributed through the call center and tep.com and will be available for various public awareness events (school training, presentations, seminars etc);
- **Inserts** mailed to communicate the program to all customers who sign-up for new service;
- **Email newsletter** article sent to all registered tep.com users;
- **Metro and traffic radio, small space print and Internet** advertising used as appropriate to further communicate the value of the TOU program;
- **Media relations** prepared to answer questions posed by the media; and
- **Door Tags** will be left behind from the metering department when a meter is exchanged. This will be a TOU brochure explaining the benefits of the TOU rates with some ways to conserve energy and save money with the new rates.

The actual notification and delivery strategy for TOU Education is outlined in the following Table 1:

Table 1. Notification and Delivery Strategy for Time-Of-Use Education

	Type of Customer	Delivery Strategy	Customer Notification
(1)	New residential and commercial customers (including customers that move within the service territory) (rates 1, 201A, 10)	TEP's metering department will set TOU meters as customers request new service.	TEP Customer Service Representatives will inform customers regarding the TOU rates as customers call to set up new service. (See Marketing and Communications Section)
(2)	Existing TOU residential, and small general service	Delivery and implementation will occur over an 18 month	TEP will send letters to customers informing them about the new TOU

Education and Outreach Program

	customers (SGS) (rates 21, 70, 201B, 201C, 76) <i>plus</i> Large General Service (LGS) (rates 13, 85A, 85F)	timeframe for approximately 9,500 customers. Commercial customers (#1,600) will be replaced first and then residential. (#7,900) (See Implementation timeline)	rates several months prior to the TOU meter installation. TEP would send a follow up letter prior to the billing month informing the customer of the billing change and effective date. In addition TEP Customer Service Representatives will call the customer to set up appointments for a meter exchange.
(3)	Large Light and Power (LLP) Customers (rates 14, 90A, 90F)	LLP customers will be migrated to the new 90N TOU rate as their contracts will allow.	TEP LLP Account Managers will contact the customer individually and directly through phone calls and personal meetings to inform customers regarding the TOU rates and contractual implementation timelines.

Program Implementation Schedule

The Residential, Commercial and Academic Education Programs will be continued throughout the regulatory process to approve on-going support of the efforts. The TOU Education will follow the implementation schedule shown in Table 2 below:

Table 2. Program Implementation Schedule

Description	2007				2008				2009			
Submit New Program for ACC approval												
New Program approval (estimated)												
Create Marketing Materials												
Develop Communication Plan												
Marketing Kick-Off												
Sign New Customers to TOU												
Program Evaluation												

Monitoring and Evaluation Plan

It is not possible to monitor many of the components of the Education and Outreach Program due to the nature of the advertising and communication plans used where there is no direct feed-back loop. Where possible however, TEP will collect data available to determine participation.

Academic Education will be tracked by the total number of students who participate, the number of schools and the number of teachers involved.

Web audits will be tracked based on the number of customers who complete at least one page of the on-line audit form. The total number of "hits on each site" can also be determined but the "hits on each site" do not indicate whether or not the visitor had completed any part of the analysis.

Because TOU will be mandatory for new customers, it is not appropriate to evaluate TOU Education on the number of new TOU meters. The education plan for this program is intended to

Education and Outreach Program

increase knowledge and awareness of TOU and demonstrate advantages to the customer for shifting load to off-peak time periods.

Program Costs

Program budget shown in Table 3 includes labor from program development, reporting, implementation, and campaign development. Budgets also include market delivery such as print and radio campaigns, printing brochures, print advertising, web advertising, and seminars to target groups.

Table 3. Program Costs (Budget)

INITIAL START-UP YEAR (2008)	
Residential and Commercial Education	\$200,000.00
Residential and Commercial Education On-Line	
Audit (Software License)	\$101,000.00
Academic Education	\$50,000.00
Time-Of-Use Education	\$300,000.00
Total Residential & Commercial	\$651,000.00
ANNUAL ON-GOING COST	
Residential and Commercial Education	\$200,000.00
Residential and Commercial Education On-Line	
Audit (Software License)	\$101,000.00
Academic Education	\$50,000.00
Time-Of-Use Education	\$200,000.00
Total Residential & Commercial	\$551,000.00

Table 4 shows that 89% of the 2009 – 2012 total budget is allocated for training. The 2008 administrative budget reflects the cost of curriculum development, while EM&V activity remains constant at 2% throughout the planning period. Appendix 2 provides addition details on the 2008 budget.

Table 4. 2008 Program Budget

	2008	2009-2012
Total Program Budget	\$651,000	\$551,000
Total Administrative and O&M Cost Allocation	\$110,670	\$33,060
Managerial & Clerical	\$90,749	\$27,109
Travel & Direct Expenses	\$11,067	\$3,306
Overhead	\$8,854	\$2,645
Total Administrative Cost	\$110,670	\$33,060
Total Marketing Allocation	\$32,550	\$16,530
Internal Marketing Expense	\$16,275	\$8,265
Subcontracted Marketing Expense	\$16,275	\$8,265
Total Marketing Cost	\$32,550	\$16,530
Total Direct Implementation	\$494,760	\$490,390
Financial Incentives	\$494,760	\$490,390
Support Activity Labor	\$0	\$0
Hardware & Materials	\$0	\$0

Education and Outreach Program

Rebate Processing & Inspection	\$0	\$0
Total Direct Installation Cost	\$494,760	\$490,390
Total EM&V Cost Allocation	\$13,020	\$11,020
EM&V / Research Activity	\$13,020	\$11,020

Estimated Energy Savings

As an education, outreach and market transformation program there is no calculation for energy and demand savings. TEP is requesting approval to recover the cost of the program through DSM but will claim no energy or demand savings. However, TEP believes that this program directly impacts the participation in, and thus savings from, its other DSM programs.

Program Cost Effectiveness

TEP is not proposing to track the cost effectiveness of the educational programs. Savings are difficult if not impossible to quantify and typically are not tracked in these types of educational programs. Again, however, TEP believes that the cost effectiveness of its other DSM programs is impacted by the Education and Outreach Program.

Education and Outreach Program

Appendix 1 – 2006 Annual Rate Data and TOU movement

Revenue Summary Report Tucson Electric Power Company

TOU Tariff Placement		12 Months Customers Dec-06	12 Months KWH Dec-06	12 Months Revenue Dec-06
Retail Sales:				
Residential:				
RT 1 Regular	New Customers will be placed on rate 70N	342,620	3,527,134,616	\$323,237,704
RT 2 Water Heating	NA	2,394	5,235,624	\$374,010
Rt 21 Time-of-Use	All Customers will be moved to the rate 70N	2,876	51,739,012	\$3,996,513
Rt 51 Private Street & Area Light	NA	1,219	695,760	\$202,092
Rt 70 Time-of-Use	All Customers will be moved to the rate 70N	4,229	61,103,338	\$4,976,091
Rt 201 A	New Customers will be placed on rate 201BN	7,178	79,840,421	\$6,468,927
Rt 201 B	All Customers will be moved to the rate 201BN	536	6,881,610	\$481,519
Rt 201 C	All Customers will be moved to the rate 201CN	207	2,190,524	\$146,692
Residential Unbilled Revenue		0	43,548,000	\$3,576,000
Residential		357,646	3,778,368,905	\$343,459,548
Commercial:				
Rt 10 General Service	New Customers will be placed on rate 76N	32,732	1,733,743,829	\$183,096,271
Rt 10 General Service PRS	NA	1	207,680	\$27,275
Rt 11 Mobile Home Park	NA	357	60,093,445	\$5,144,151
Rt 31 Interruptible Agr. Pumping	NA	41	15,880,058	\$812,837
Rt 52 Private Street & Area Light	NA	3,273	4,765,400	\$1,519,093
Rt 76 Time-of-Use	All Customers will be moved to the rate 76N	973	129,439,048	\$11,180,787
Commercial Unbilled Revenue		0	15,012,000	\$1,504,000
Commercial		34,104	1,959,141,460	\$203,284,414
Industrial:				
Rt 13 Large General Service	All Customers will be moved to the rate 85N	597	1,203,620,147	\$96,590,161
Rt 13 Large General Service PRS	NA	2	4,794,487	\$677,481
Rt 14 Large Light & Power	All Customers will be moved to the rate 90N	8	606,793,402	\$36,992,760
Rt 14 Large Light & Power PRS	NA	1	93,765,600	\$7,431,748
Rt 85 TOU Large General Service	All Customers will be moved to the rate 85N	51	129,066,164	\$9,120,875
Rt 90 TOU Large Light & Power	All Customers will be moved to the rate 90N	5	241,783,000	\$14,205,813
Industrial Unbilled Revenue		0	(1,579,000)	\$49,000
Industrial		664	2,278,243,800	\$165,067,837
Mining:				
Rt 15 Large Light & Power - Mining	All Customers will be moved to the rate 90N	2	926,300,900	\$43,788,700
Mining Unbilled Revenue			(1,403,000)	(\$65,000.00)
Mining		2	924,897,900	\$43,723,700
Public Streets & Highway Lighting:				
Rt 41 Muni Traf. Sig.-Street Light	NA	4	24,132,797	\$1,637,678
Rt 47 Muni Traf. Sig.-Str. Light-Sec	NA	4	9,397,676	\$637,735
Rt 50 Public Street Lighting	NA	18	1,769,583	\$462,116
Public Lighting Billed Revenue Adj	NA	0	0	\$0
Public Lighting Unbilled Revenue	NA	0	208,000	\$10,000
Public Streets & Highway Lighting		26	35,508,056	\$2,747,530
Other Sales - Public Authorities:				
Rt 40 Muni Serv. Bldg.-Grounds-Sec	NA	3	101,171,460	\$8,163,871
Rt 43 Muni Water Pumping	NA	32	123,574,584	\$8,021,460
Other Public Sales Billed Revenue Adj	NA	0	0	\$0
Other Public Sales Unbilled Revenue	NA	0	513,000	\$2,000
Other Sales - Public Authorities		35	225,259,044	\$16,187,332
Total Retail Sales		392,477	9,201,419,165	\$774,470,361

All Large Light and Power and Mining Customers will be moved as contracts allow

New Customers are defined as (1) new customers in TEP's territory and (2) existing TEP customer that move within the territory

Education and Outreach Program

Appendix 2 – Program Costs

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$27,109	
Labor - Clerical	\$1,355	5.0%
Labor - Program Design	\$1,355	5.0%
Labor - Program Development	\$1,355	5.0%
Labor - Program Planning	\$4,066	15.0%
Labor - Program/Project Management	\$2,711	10.0%
Labor - Staff Management	\$2,711	10.0%
Labor - Staff Supervision	\$1,355	5.0%
Subcontractor Labor - Clerical	\$1,355	5.0%
Subcontractor Labor - Program Design	\$2,711	10.0%
Subcontractor Labor - Program Development	\$3,524	13.0%
Subcontractor Labor - Program Planning	\$1,355	5.0%
Subcontractor Labor - Program/Project Management	\$3,253	12.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$27,109</i>	<i>100.0%</i>
Travel & Direct Expenses	\$3,306	
Conference Fees	\$331	10.0%
Labor - Conference Attendance	\$331	10.0%
Subcontractor - Conference Fees	\$66	2.0%
Subcontractor - Travel - Airfare	\$132	4.0%
Subcontractor - Travel - Lodging	\$66	2.0%
Subcontractor - Travel - Meals	\$66	2.0%
Subcontractor - Travel - Mileage	\$66	2.0%
Subcontractor - Travel - Parking	\$66	2.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$298	9.0%
Subcontractor Labor - Conference Attendance	\$66	2.0%
Travel - Airfare	\$463	14.0%
Travel - Lodging	\$331	10.0%
Travel - Meals	\$165	5.0%
Travel - Mileage	\$165	5.0%
Travel - Parking	\$99	3.0%
Travel - Per Diem for Misc. Expenses	\$595	18.0%
<i>Travel & Direct Expenses</i>	<i>\$3,306</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$2,645	
Equipment - Communications	\$53	2.0%
Equipment - Computing	\$53	2.0%
Equipment - Document Reproduction	\$53	2.0%
Equipment - General Office	\$53	2.0%
Equipment - Transportation	\$53	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$26	1.0%
Labor - Accounts Receivable	\$26	1.0%
Labor - Administrative	\$26	1.0%

Education and Outreach Program

Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$26	1.0%
Labor - Contract Reporting	\$26	1.0%
Labor - Corporate Services	\$26	1.0%
Labor - Facilities Maintenance	\$26	1.0%
Labor - Information Technology	\$26	1.0%
Labor - Materials Management	\$26	1.0%
Labor - Procurement	\$26	1.0%
Labor - Regulatory Reporting	\$1,058	40.0%
Labor - Shop Services	\$26	1.0%
Labor - Telecommunications	\$26	1.0%
Labor - Transportation Services	\$26	1.0%
Office Supplies	\$26	1.0%
Postage	\$26	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$926	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$2,645</i>	<i>100.0%</i>
Total Administrative Costs	\$33,060	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$8,265	
Advertisements / Media Promotions	\$2,066	25.0%
Bill Inserts	\$331	4.0%
Brochures	\$496	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$413	5.0%
Labor - Customer Outreach	\$413	5.0%
Labor - Customer Relations	\$413	5.0%
Labor - Marketing	\$2,480	30.0%
Print Advertisements	\$1,240	15.0%

Education and Outreach Program

Radio Spots	\$413	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$8,265</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$8,265	
Subcontractor - Bill Inserts	\$413	5.0%
Subcontractor - Brochures	\$413	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$827	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$413	5.0%
Subcontractor Labor - Customer Outreach	\$413	5.0%
Subcontractor Labor - Customer Relations	\$413	5.0%
Subcontractor Labor - Marketing	\$413	5.0%
Television Spots	\$0	0.0%
Website Development	\$4,959	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$8,265</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$16,530	
Direct Implementation		
Financial Incentives to Customers	\$490,390	
Activity - Labor	\$0	
Labor - Curriculum Development	\$0	8.0%
Labor - Customer Education and Training	\$0	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$0	30.0%
Subcontractor Labor - Facilities Audits	\$0	10.0%
Subcontractor Labor - Curriculum Development	\$0	5.0%
Subcontractor Labor - Customer Education and Training	\$0	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$0	2.0%
<i>Subtotal Activity</i>	<i>\$0</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$0	
Audit Applications and Forms	\$0	8.0%
Direct Implementation Literature	\$0	20.0%
Education Materials	\$0	20.0%
Energy Measurement Tools	\$0	10.0%
Installation Hardware	\$0	10.0%
Subcontractor - Direct Implementation Literature	\$0	4.0%
Subcontractor - Education Materials	\$0	4.0%
Subcontractor - Energy Measurement Tools	\$0	16.0%
Subcontractor - Installation Hardware	\$0	6.0%
Subcontractor - Audit Applications and Forms	\$0	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$0</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$0	
Labor - Field Verification	\$0	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$0	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$0	10.0%
Subcontractor Labor - Field Verification	\$0	20.0%
Subcontractor Labor - Rebate Processing	\$0	30.0%
Subcontractor Labor - Site Inspections	\$0	20.0%

Education and Outreach Program

<i>Subtotal Rebate Processing and Inspection</i>	<i>\$0</i>	<i>100.0%</i>
Total Direct Implementation	\$490,390	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$11,020	
Labor - EM&V	\$551	5.0%
Materials - EM&V	\$551	5.0%
Subcontractor Labor - EM&V	\$9,918	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$11,020</i>	<i>100.0%</i>
EM&V Overhead	\$0	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$0	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$0	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$0</i>	<i>100.0%</i>
Total EM&V	\$11,020	
Total Budget	\$551,000	

Attachment 2

Direct Load Control Program

Attachment 2

Direct Load Control Program

Direct Load Control Program

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TEP Direct Load Control Program

Program Concept and Description

The Direct Load Control ("DLC") Program is designed to reduce critical peak demand during specific short-term peak hours. Demand reduction is accomplished by sending a radio frequency control signal through a thermostat to turn off air conditioning equipment ("AC"). Once AC operation has been interrupted, the cycling time of AC equipment is controlled using a 50% cycling strategy for a maximum of four hours per occurrence or until the critical peak condition ends. DLC events are normally limited to less than 100 hours each year.

On TEP's system these critical peak conditions represent approximately 11% of the required demand but only 0.1% of energy. This indicates a very steep load duration curve that presents the ideal conditions necessary to take advantage of this type of Demand Response ("DR") program. While the DLC Program does not replace the need for all peaking generation units it does provide TEP and their customers with a viable alternative.

TEP is requesting to implement the DLC Program and recover the cost of the program as a part of the DSM Portfolio and the DSM Adjustor Mechanism.

Target Market

The target program segments most suited to a DLC Program are residential and small commercial, focusing on single-family homes with air-conditioning and small commercial establishments, including fast food and convenience stores. This kind of program, targeting these customer segments, has been used with continued success at utilities across the country including Xcel Energy, Florida Power & Light, San Diego Gas & Electric, ISO New England, and Public Service New Mexico.

Current Baseline Conditions

TEP has approximately 246,000 residential customers with central air conditioning (357,646 total at 69% saturation of AC), and 35,000 small to large commercial customers with air conditioning and other loads that could be controlled through the program. TEP has not conducted a DR inventory or a technical potential study of DR resources in its territory but intends to conduct a baseline study to gather this information in the near future. Funding for the baseline study will be requested in a separate docket and is not part of this Program Plan.

Program Eligibility

The DLC Program will be marketed to a targeted group of customers in TEP's service region. The program will be offered to TEP's residential customers with central air conditioning and to non-residential customers with controllable loads. All customers must receive electric service from Tucson Electric Power Co in order to participate in this program. TEP will not offer the DLC Program to schools, retirement homes, hospitals or to other customers who have the need for stringent temperature and/or humidity control.

Program Rationale

The economic justification for energy efficiency (EE) is different than the economic justification for DR. The result of the use of EE in the resource plan and in practice is to reduce the variable need for and cost of energy resources. Energy resources are generally valued in terms of cost per kWh, which reflect the incremental operating costs of electrical generation, including variable fuel costs and variable operations and maintenance ("O&M") costs. The additional benefits of EE are the reduced losses on transmission and distribution wires and equipment (losses) and the reduced variable costs of environmental mitigation.

In contrast to EE, DR is distinguished largely by its use as electrical capacity, for example as reserve capacity to ensure reliability when contingencies occur and when peak capacity periods occur or as reserve capacity that is used when the price per MW of DR is the lowest cost capacity option. DR used as capacity resources involves avoided expenditures for fixed cost components to deliver electricity to the customer. That is, capital costs for generation, transmission, distribution, and environmental mitigation can be avoided with use of DR resources. DR is mainly used to reduce the need for peak-load resources, including peaking generation, transmission, distribution, and environmental mitigation. The possible uses of DR are as follows:

- Reserve capacity to address resource adequacy requirements and planned outages;
- Reserve capacity to address contingencies, such as unanticipated peaking needs (e.g., from heat storms), generation outages, transmission outages, distribution outages;
- Capacity to reduce economic costs, such as costs for market resources during periods of scarcity or the use of expensive utility-owned resources;
- Capacity during declared emergencies when operating reserves fall below WECC requirements;
- Capacity to meet anticipated new NERC/FERC reliability standards (being adopted);
- Capacity to reduce the need for incremental transmission and distribution;
- Capacity to reduce the need for environmental mitigation;
- Grid losses from reduced need for capacity at the end-use including losses on transmission and distribution;
- Reduced need to meet ancillary services requirements as a result of DR that displaces generation placed on the wholesale grid;
- Congestion mitigation at specific locations;
- Ramping capacity, to meet within-hour needs for power to avoid criteria violations (of grid operating requirements);
- Energy costs when DR is made operational by reducing demand or by dispatching; and
- Short term reduction of very high-priced energy needs.

Thus, the value of DR is a function of the number of uses that can be tapped and the specific capital and operating costs avoided that otherwise are incurred to provide these services.

Program Objectives

The objectives of the DLC Program are:

- Install DLC on approximately 100,000 residential central ACs, and small- to mid-sized commercial customers with controllable loads within the next 10 years, with an average installation rate of 10,000 sites per year. TEP expects that roughly 80% of program participants will be residential, while 20% will be commercial;

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- Establish communications protocols, select and install software packages and determine vendor services desired for implementation of direct load control;
- Gather market knowledge of additional DR opportunities and applications for direct load control among TEP's customer base through a formal baseline study; and
- Conduct a process, operational, customer satisfaction, and impact analysis to determine program success.

TEP may also choose a program developed in-house for residential and small commercial DR Program that incorporates DR control of AC equipment in residential and small commercial buildings. There may be additional equipment having two-way radio control communications that tie to possible AMR/AMI system development, possible intermittency management control needs for distributed generation PV systems installed as a result of TEP's Renewable Energy Standard & Tariff programs, and time shift control for future plug-in hybrid vehicle charging stations.

Products and Services Provided

TEP has the choice to either contract with a DLC vendor or provide the following functions internally as part of a DLC Program:

- Call Center works directly with the Program manager;
- Business information systems setup includes data integrity, installation scheduling, customer care, and service tracking;
- Call scripting and training;
- Complete program design, management, program reporting;
- Prepare responses to frequently asked questions;
- Quality reviews;
- Load management system setup including definition of control configuration, program updates and switch programming;
- Control website setup and training;
- System security setup;
- Redundant setup of all systems;
- Server setup;
- Proactive and predictive replacement of any equipment; and
- Training for events.

Each customer will receive a new thermostat after signing a customer participation agreement. Sample participation agreement is included in Appendix 1.

Delivery Strategy and Administration

TEP may manage this program with in-house personnel but may also choose to contract with a vendor or implementation contractor. TEP may solicit a qualified vendor for delivery of load control devices, control equipment and systems, and related services. TEP will (1) purchase all equipment and software; (2) identify customers; (3) provide marketing and support paging systems, load management systems,

Direct Load Control Program

control operations, reporting functions, maintenance, and call center functions. In-house operation provides additional opportunities to include two-way radio control communications that tie to possible AMR/AMI system development, possible intermittency management control needs for distributed generation PV systems installed as a result of TEP's Renewable Energy Standard & Tariff programs, and time shift control for future plug-in hybrid vehicle charging stations.

TEP will install communicating thermostats in customer homes and small commercial facilities. Participants will be required to agree that TEP may install equipment on their property for the express purpose of allowing TEP to limit electricity usage on their electrical equipment during specified times, not to exceed 100 hours per year or four hours during any one event.

Participant must agree to remain a participant in the DLC Program for a minimum of one year. Participant will have the right at any time to over-ride a specific remote setting override (maximum of one override per day) by making a manual adjustment at the thermostat. TEP believes this override protocol will enhance the program and benefit the customer with more choice.

Participant must agree to remain a participant in the DLC Program for a minimum of one year. Participant will have the right at any time to over-ride a specific control event by notifying TEP in writing or by telephone. Participant will have the right at any time after the first year to terminate the service by notifying TEP in writing or by telephone. The program implementation plan is included in Appendix 2.

Marketing and Communications

Program marketing will be conducted by TEP staff and will consist of the following marketing activities and processes:

- An integrated multi-media marketing strategy targeting residential and commercial segments;
 - Positioning research and develop messaging plans for various channels: print, radio, web/ on-line, and events participation;
 - Multiple versions of direct mail collateral, bill inserts, and brochures;
 - Training and scripts for TEP's call centers and periodic updates according to marketing campaigns;
 - Web enrollment process and online experience;
 - Marketing campaigns for small and medium commercial customers;
 - TEP bill inserts, PR group, employee communications, and cross selling plans at call center
 - Marketing enrollment campaigns based on market specific customer feedback and survey results;
 - Delivery with other TEP DSM programs, such as the Guaranteed Homes, Low Income Weatherization, Residential HVAC, Existing C&I, Small Commercial and Efficient Commercial Building Design programs; and
 - Promotion of the program as a strategy to be presented under the Energy Education and Outreach program.
-

Program Implementation Schedule

TEP intends to begin implementation of the DLC Program in the first quarter of 2009. This goal requires that an equipment and service provider be selected by the fourth quarter of 2008. Equipment must be ordered by early

Direct Load Control Program

in the fourth quarter of 2008, equipment installations beginning in the second quarter 2009, and system installations completed prior to the summer cooling season. TEP will begin program planning by the second quarter of 2008 in order to identify candidate equipment and service providers, prepare RFPs and solicit bids for products and services, and select a provider. Table 1 presents an overview of the delivery schedule and subsequent evaluation and program re-design activities.

Table 1. Direct Load Control Program Implementation Schedule

Program Activities	2007				2008				2009			
Submit Program to ACC for approval												
New program approval (estimated)												
Select DLC product vendor												
Program Marketing and Communications												
Announcement and customer sign-on												
DLC equipment installation and initialization												
DLC pilot control period												
Program process and impact evaluation												
Program redesign as needed												

Monitoring and Evaluation Plan

The Measurement, Evaluation and Research (“MER”) strategy will include the following features:

- TEP will adopt an evaluation strategy that calls for integrated data collection, measurement and evaluation. The integrated evaluation method has the benefit of collecting evaluation-related data at the time of implementation rather than at some time after the fact thereby minimizing data collection costs and recall and other data search problems. The integrated evaluation approach requires the implementation team to collect data and conduct project tracking and data management that will support evaluation. This method will provide TEP with the distinct advantage of having real-time or near real-time feedback on program progress and enable program management to adjust or correct the program so as to be more effective, provide a higher level of service, and be more cost beneficial.
- TEP will hire an independent third party measurement, evaluation and research (MER) contractor at the beginning of the program who will provide ongoing data collection, evaluation research, and reporting on program activities. The MER contractor will work closely with TEP and the implementation contractor to ensure that the necessary data is collected for monitoring and evaluation activities.
- The MER contractor will conduct impact and process evaluations of the program on a yearly basis in order to:
 - determine energy and demand savings attributable to the program;
 - assess the cost-effectiveness of the program;
 - gauge customer and trade partner response to and satisfaction with the program;
 - assess program functional efficiency;
 - identify ways to improve the program and program cost-effectiveness; and
 - determine the degree to which the program is transforming the market for high- efficiency HVAC equipment, quality installation techniques and diagnostic, test and repair methods.

Direct Load Control Program

Total Program Costs

The 2008 program year budget of approximately \$3,975,000 will be allocated approximately as shown in Table 2, while Table 3 provides the expected program budgets through 2012. Appendix 3 provides addition details on the 2008 program year budget.

Table 2. 2008 Efficient Commercial Building Design Program Budget

Total Program Budget	\$3,970,500
Total Administrative Cost Allocation	
Managerial & Clerical	\$444,696
Travel & Direct Expenses	\$66,704
Overhead	\$44,470
Total Administrative Cost	\$555,870
Total Marketing Allocation	
Internal Marketing Expense	\$158,820
Subcontracted Marketing Expense	\$158,820
Total Marketing Cost	\$317,640
Total Direct Implementation	
Installation Equipment and Labor	\$2,821,437
Support Activity Labor	\$90,527
Hardware & Materials	\$15,088
Rebate Processing & Inspection	\$90,527
Total Direct Installation Cost	\$3,017,580
Total EM&V Cost Allocation	
EM&V Activity	\$75,440
EM&V Overhead	\$3,971
Total EM&V Cost	\$79,410

Table 3. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total budget	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437
Installation Equipment and Labor	\$2,821,437	\$2,371,407	\$2,530,379	\$2,691,486	\$2,854,791
Administrative Costs	\$1,149,063	\$965,783	\$1,030,526	\$1,096,139	\$1,162,646
Installation as % of budget	71%	71%	71%	71%	71%

Estimated Energy Savings

Direct Load Control Program

The type of construction for residential and commercial customers participating in the DLC Program will impact the temperature rise that occurs during a control event. The size of equipment installed in residential and commercial structures will impact the approximate kW reduction with each thermostat. The initial 50% cycling strategy combined with these two factors will determine the total kW reduction possible during control events. Cycling strategies may be modified in older buildings to prevent an unreasonable temperature rise during a control event, but this will be determined on a case-by-case basis. Note that yields from DLC systems are highly weather dependant, however, on extreme heat days the probability that all systems participating in the program will be operating, and thus available to respond to a DLC event and provide the targeted reduction, is very high. Using the best information currently available for the Tucson market, it is estimated that the average impact for each thermostat at these extreme conditions will be approximately 2.5 kW. This is the average expected load reduction for the combined total of residential and small or large commercial DLC installations. Coincident and non-coincident demand reductions are considered to be constant for this demand response program.

In order to assure that the program realizes its demand reduction potential, TEP will select a product and service vendor with advanced control technology and software.

TEP expects to enroll 10,000 customers annually in the program, with a target participation of 100,000 customers by 2017. The total annual participation goals and demand and energy savings for the 2008 – 2012 planning horizon are presented in Table 4.

Table 4. Direct Load Control Program Annual Energy Savings

Year	2008	2009	2010	2011	2012
Thermostats participating	10,000	20,000	30,000	40,000	50,000
Annual Incremental Demand Reduction (MW)	26.9	26.9	26.9	27.3	26.6
Annual Incremental Change in Energy (MWh)	908	702	652	980	2,176
Cumulative Non-Coincident Demand Reduction (MW)	26.9	53.9	80.8	108.1	134.7
Cumulative Coincident Demand Reduction (MW)	26.9	53.9	80.8	108.1	134.7
Cumulative Change in Energy (MWh)	908	1,610	2,263	3,243	5,419

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2008 – 2012 presented in Table 5.

Table 5. Projected Environmental Benefits, 2008 - 2012

Water Savings	2,180,869	Gallons
SOx	10,425	Lbs
NOx	17,316	Lbs
CO2	9,107,308	Lbs

Program Cost Effectiveness

The Tables below provide a summary of the estimated benefit/cost ratios of the program activities for the 2008 – 2012 planning time frame. This includes the present values over 20 years for the benefits and costs for approximately 50,000 load control thermostats through 2012, including a planned replacement of 4% of

Direct Load Control Program

thermostats annually due to failures or customer opt-out. Table 6 provides the benefit costs using a societal discount rate of 5.0%, and the present values of costs and benefits using the utility cost of capital discount rate of 8.5%. Additional detail is presented in Appendix 4.

Table 6. Benefit – Cost Test Scenarios, 2008 - 2012

Cost Effectiveness Tests	5.0% Societal Discount Rate		8.5% Cost of Capital Discount Rate	
	RIM	TRC	RIM	TRC
PV of Program Benefits	\$28,448,371	\$28,448,371	\$26,104,199	\$26,104,199
PV of Program Costs	\$21,883,362	\$18,673,657	\$23,731,090	\$18,673,657
Benefit/Cost Ratio	1.3	1.5	1.1	1.3

Appendix 1 – DLC Participation Agreement

DRAFT

PARTICIPATION AGREEMENT

THIS PARTICIPATION AGREEMENT is hereby entered into as the _____ day of 200____ by and between Tucson Electric Power Company, ("TEP") and _____ ("Participant"). By signing below, Participant agrees to participate in the TEP Direct Load Control Program (the "Program") in accordance with the express terms of the Program and the terms and conditions set forth below.

1. To facilitate Participant's participation in the Program, TEP will provide and install a specially designed programmable thermostat (the "Equipment") at Participant's designated premises (the "Premises"). Such installed Equipment will enable TEP to limit Participant's electricity usage during specified times, not to exceed 100 hours per year or four hours during any one day, as specifically provided in the Program. Participant agrees to remain in the TEP DLC Program for a minimum of one year after the date of this agreement.
2. TEP (or its subcontractors) will install the Equipment by attaching it to the central A/C unit serving the Premises. The Participant must be present at the Premises during installation of the Equipment. TEP will schedule a mutually convenient installation time with the Participant.
3. Following installation of the Equipment, TEP, in its discretion, will periodically inspect and, if necessary, repair and/or replace defective Equipment, at no cost to Participant. Provided, if at any time while the Equipment is on the Premises, TEP reasonably determines that the Equipment requires repair or replacement as a result of damage caused by Customer's misuse, negligence, or abuse of the Equipment, TEP will perform such repair or replacement and the Participant will be responsible for the costs thereof (including parts and labor). Except as otherwise expressly provided herein, Participant is not responsible for the installation, maintenance, repair, or removal of the Equipment.
4. The Equipment is and at all times shall remain the property of TEP and Participant shall have no rights therein. None of the Equipment shall become a fixture to the Premises.
5. Participant agrees to provide TEP with adequate access to the Premises to enable TEP to install, inspect, repair and/or remove the Equipment from the Premises, all as set forth herein.

Direct Load Control Program

6. TEP shall have no responsibility for the Premises or any Participant equipment, including the condition or repair thereof. Participant is responsible for the repair and maintenance of the Premises and all Participant equipment and all costs associated therewith.
7. PARTICIPANT ACKNOWLEDGES THE EQUIPMENT CONTROLS ELECTRICITY, WHICH IS DANGEROUS. PARTICIPANT AGREES THAT NEITHER PARTICIPANT NOR ANY OTHER PERSON (EXCEPT TEP'S AUTHORIZED PERSONNEL) WILL OPEN, TAMPER WITH, SERVICE, MAKE ANY ALTERATIONS TO, OR REMOVE ANY EQUIPMENT FROM ITS POINT OF INITIAL INSTALLATION, WITHOUT TEP'S PRIOR WRITTEN CONSENT. Participant shall notify TEP if Participant intends to sell the Premises or to otherwise disconnect the Equipment. Any conduct in violation of this Section 7 shall be considered a material breach of this Agreement.
8. Participant acknowledges and agrees that TEP may monitor electricity usage data electronically from time to time and may disclose such information in the aggregate, if necessary, in accordance with the Program and to otherwise satisfy legal requirements.
9. Participant shall have the right, at any time, to terminate its participation in the Program by notifying TEP in writing 30-days prior to termination. In the event Participant elects to terminate such participation, Participant must allow TEP access to the Premises to remove the Equipment as soon as practicable.
10. TEP shall have the right, at any time after providing 30-day advance written notification, to terminate agreement with any participant. In the event that TEP elects to terminate such participation, Participant must allow TEP access to the Premises to remove the Equipment as soon as practicable.
11. The Participant agrees that TEP will not be liable for any failure or interruption of power resulting from the use of the Equipment or application of the Program. IN NO EVENT SHALL TEP BE LIABLE TO THE PARTICIPANT FOR ANY SPECIAL, INDIRECT, INCIDENTAL, PUNITIVE OR CONSEQUENTIAL DAMAGES OF ANY KIND STEMMING FROM TEP'S PERFORMANCE OF THIS AGREEMENT OR APPLICATION OF THE PROGRAM, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN AN ACTION FOR CONTRACT, STRICT LIABILITY OR TORT (INCLUDING NEGLIGENCE) OR OTHERWISE, WHETHER OR NOT TEP HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND NOTWITHSTANDING THE FAILURE OF ESSENTIAL PURPOSE OF ANY REMEDY.
12. TEP DOES NOT GUARANTEE OR WARRANT THAT THE EQUIPMENT OR PROGRAM WILL ENSURE SYSTEM RELIABILITY OR THE CONTINUOUS

DELIVERY OF POWER. OTHER THAN THE WARRANTIES AND REPRESENTATIONS EXPRESSLY SET FORTH IN THIS AGREEMENT, THE PARTIES HEREBY DISCLAIM ALL REPRESENTATIONS AND WARRANTIES. THE PROGRAM AND EQUIPMENT ARE PROVIDED "AS IS." YOU UNDERSTAND AND ACKNOWLEDGE THAT TEP MAKES NO REPRESENTATIONS OR WARRANTIES ABOUT THE EQUIPMENT OR PROGRAM, WHICH ARE BOTH PROVIDED WITHOUT WARRANTY OF ANY KIND, INCLUDING, WITHOUT LIMITATION, ALL IMPLIED WARRANTIES AND CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, TITLE, AND NON-INFRINGEMENT. ALL WARRANTIES ARE DISCLAIMED BY TEP TO THE FULLEST EXTENT OF THE LAW.

13. Participant agrees to hold harmless, defend, and indemnify TEP, its subsidiaries, affiliates, officers, agents, and employees from and against any and all losses, actions, proceedings, demands, suits or other disputes, claims, damages, liens, or liabilities, costs, expenses, penalties, assessments, and judgments (including reasonable attorneys' fees and interest) incurred in connection with, arising out of, resulting from or incident to Participant's improper use of the Equipment or the Program.
14. TEP shall not be responsible for damages or delays in performance of this Agreement caused by Acts of God, acts and/or omissions of federal, state and local governmental authorities and regulatory agencies or other events that are beyond the reasonable control of TEP that could not have been reasonably foreseen or prevented and the obligations of TEP under this Agreement shall be suspended by the occurrence of such unforeseen event for the duration of the event.
15. This Agreement constitutes the entire agreement between the Participant and TEP with respect to the subject matter hereof and supersedes any prior understanding intentions, representations, or agreements, oral or written, with respect thereto. This Agreement may not be modified or supplemented except by written instrument signed by the parties hereto.
16. This Agreement and its validity, interpretation, performance, and enforcement shall be governed by the laws of the State of Arizona, without regard to any conflicts of law provision that would cause the application of the laws of any jurisdiction other than the State of Arizona. Jurisdiction and venue in any action arising hereunder shall be in a court of competent subject matter jurisdiction located in Pima County, Arizona.
17. Those provisions of this Agreement regarding indemnification, warranty, and limitations of liability shall survive the termination of this Agreement.
18. No waiver of any default of any provision herein shall be deemed a waiver of any other default thereof or of any other provision herein. The failure of either party to enforce at any time any of the provisions of this Agreement shall not be deemed to be a waiver of the right of either party thereafter to enforce any such provisions.

Direct Load Control Program

19. If any part of this Agreement is finally adjudicated to be void and/or unenforceable, such part shall be deemed severed from this Agreement which shall otherwise remain in full force and effect.
20. This Agreement and the rights, duties, and obligations hereunder may not be assigned or delegated by Participant without the prior written consent of TEP. Any purported assignment or transfer made in violation of this section shall be deemed null and void, and shall be of no effect. TEP may assign or delegate any of its rights or obligations under this Agreement in its sole discretion.
21. All notices under this Agreement shall be in writing and shall be given to the parties hereto by personal service, or by certified or registered United States mail, return receipt requested, or by receipted confirmed facsimile, or by e-mail with electronic confirmation or by recognized overnight courier service, to the individuals at the addresses set forth below. Any notice shall be deemed given: (i) upon delivery if delivered in person, (ii) upon the date of receipt if sent by United States mail; (iii) upon receipt of confirmation if sent by facsimile; (iv) upon delivery if delivered by commercial courier service; or (v) upon receipt if delivered by e-mail with electronic confirmation.

[addresses]

22. TEP performs under this Agreement as an independent contractor. Nothing in this Agreement is intended to create a partnership, joint venture, or agency relationship between TEP and Participant.

IN WITNESS WHEREOF, TEP and Participant have duly executed this Agreement through their authorized agents effective as of the date hereof.

TUCSON ELECTRIC POWER COMPANY

By: _____
Name: _____
Title: _____

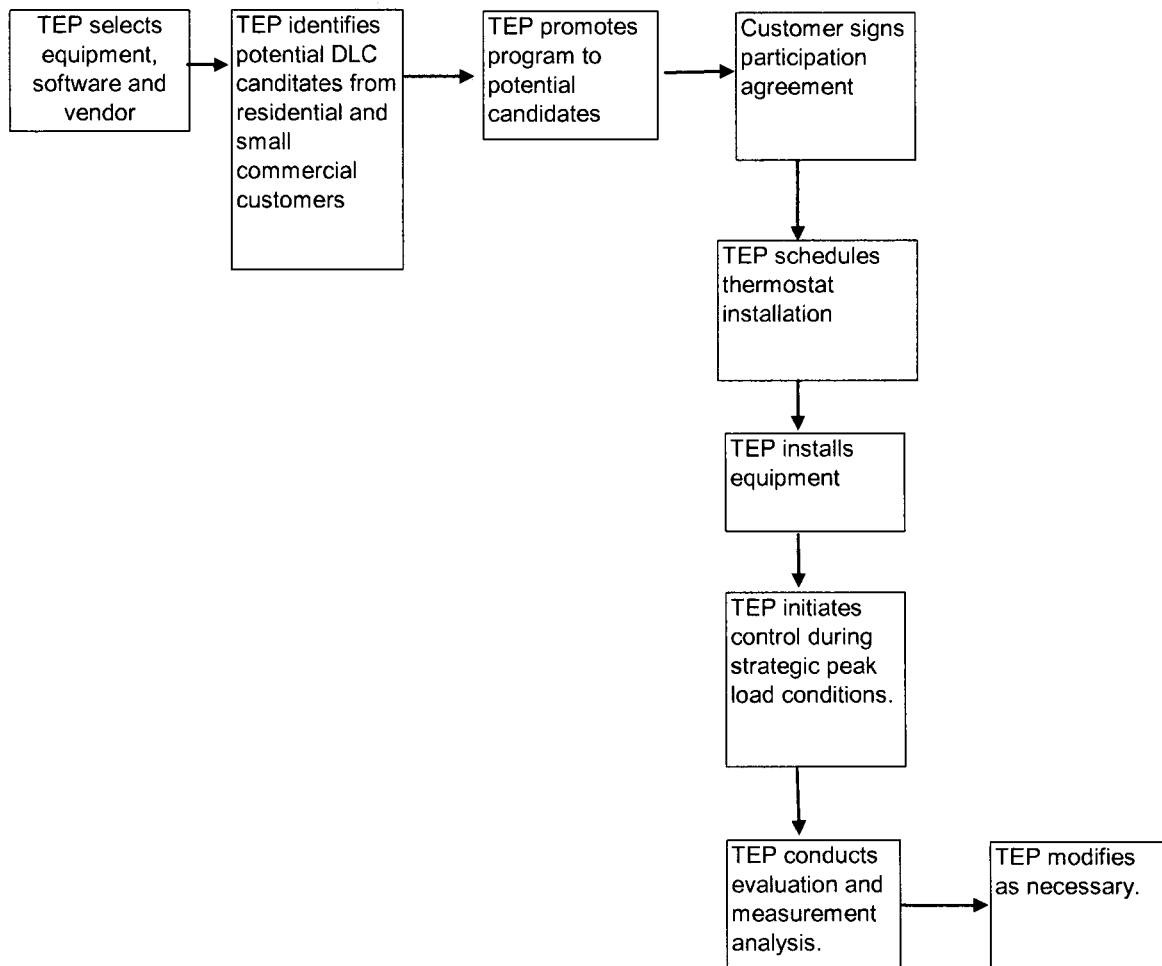
PARTICIPANT

By: _____
Name: _____
Title: _____

Direct Load Control Program

Appendix 2 – Implementation Plan

Direct Load Control Program



TEP in areas above may be TEP or an approved contractor selected by TEP

Direct Load Control Program

Appendix 3 – Program Costs

2008 Program Costs Details

Startup

Utility labor Costs	FTE	Annual loaded	Cost
Engineering	1.50	\$120,000	\$180,000
Marketing	1.25	\$100,000	\$125,000
Admin	1.50	\$100,000	\$150,000
Marketing delivery			\$180,000
Total utility			\$635,000

Outside support labor (year 1)

contract support - % of utility labor)	0.50
contract support cost	\$317,500

Ongoing

Ongoing	FTE or unit	Annual loaded	Annual Cost
Engineering	0.50	\$120,000	\$60,000
Utility admin	0.50	\$100,000	\$50,000
Utility marketing	0.50	\$90,000	\$45,000
Marketing delivery			\$60,000
Page system #1 (per month)	\$750	12	\$9,000
Page system #2 (per month)	\$750	12	\$9,000
Total ongoing			\$173,000

Factors

drop out rate	4%
inflation	3%

Cash flow

Calender Year	2008	2009	2010	2011	2012
Program Year	1	2	3	4	5
Annual New Participants	10,000	10,000	10,000	10,000	10,000
Annual Cost for New Installations DLC (Equip ad Labor)	\$3,000,000	\$3,090,000	\$3,182,700	\$3,278,181	\$3,376,526
Total Prticipants	10,000	20,000	30,000	40,000	50,000
Annual Replacements			400	800	1,200
Annual Cost for Replacing DLC (Equip ad Labor)		\$0	\$123,600	\$247,200	\$370,800
Incentives	\$0	\$0	\$0	\$0	\$0
Engineering labor	\$180,000	\$63,654	\$65,564	\$67,531	\$69,556
Marketing labor	\$125,000	\$47,741	\$49,173	\$50,648	\$52,167
Admin labor	\$150,000	\$53,045	\$54,636	\$56,275	\$57,964
Marketing delivery	\$180,000	\$63,654	\$65,564	\$67,531	\$69,556
Outside support labor (year 1)	\$317,500				
Page system #1 (per month)	\$9,000	\$9,548	\$9,835	\$10,130	\$10,433
Page system #2 (per month)	\$9,000	\$9,548	\$9,835	\$10,130	\$10,433
Other DLC vendor costs (license, etc)					
Annual Total	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437

Annual Equipment and direct installation labor	\$3,000,000	\$3,090,000	\$3,306,300	\$3,525,381	\$3,747,326
Annual admin, marketing, and engineering	\$970,500	\$247,190	\$254,605	\$262,244	\$270,111
	\$0	\$0	\$0	\$0	\$0

	Res	Com
Total Administrative and O&M Cost Allocation	\$1,033,616	\$826,893
Total Marketing Allocation	\$771,033	\$616,826
Total Direct Implementation	\$16,669,007	\$13,335,206
Total EM&V Cost Allocation	\$200,000	\$160,000
Total Cost		\$40,000
		0.05535158
		0.04128988
		0.89264826
		0.01071027

Direct Load Control Program

Appendix 4 – Program Benefits

Year	2008	2009	2010	2011	2012	Total Cost
Total budget	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437	\$18,673,657
Equipment Installation and Labor	\$2,821,437	\$2,371,407	\$2,530,379	\$2,691,486	\$2,854,791	\$13,269,501
Administrative Costs	\$1,149,063	\$965,783	\$1,030,526	\$1,096,139	\$1,162,646	\$5,404,156
Equipment Installation and Labor as % of budget	71%	71%	71%	71%	71%	
Admin to incentives	41%	41%	41%	41%	41%	
Non-coincident peak (kW)	26,936	26,936	26,936	27,022	26,936	134,768
Coincident peak (kW)	26,936	26,936	26,936	27,022	26,936	134,768
Energy Savings (kWh)	907,989	804,988	754,219	810,672	1,083,869	4,361,738
Societal Benefits	\$5,440,427	\$5,817,624	\$6,222,666	\$5,304,522	\$5,663,132	\$28,448,371
Societal Costs	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437	\$18,673,657
Net Benefits	\$1,469,927	\$2,480,435	\$2,661,760	\$1,516,898	\$1,645,695	\$9,774,714
At IRP Discount Rate						
Societal Benefits - IRP	\$5,037,321	\$5,048,157	\$5,094,786	\$5,283,378	\$5,640,558	\$26,104,199
Societal Costs	\$3,970,500	\$3,337,190	\$3,560,905	\$3,787,625	\$4,017,437	\$18,673,657
Net Benefits	\$1,066,821	\$1,710,967	\$1,533,880	\$1,495,753	\$1,623,121	\$7,430,542

Attachment 3

Low-Income Weatherization Program

Attachment 3

Low-Income Weatherization Program

Low-Income Weatherization Program

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Low-Income Weatherization Program

TEP Low-Income Weatherization Program

Program Concept and Description

TEP recognizes that many low-income customers live in older homes built when energy prices were low and energy efficient construction methods were not recognized. Many of these homes require significant repair to improve the livability of the structure and to incorporate some level of energy efficiency. The primary goal of the Low-Income Weatherization ("LIW") Program is to provide financial assistance to eligible customers for measures that improve comfort and reduce overall energy consumption. Steps taken through this program will reduce electric and gas bills and provide eligible customers with more disposable income for other needs.

The LIW Program is fuel neutral in that weatherization measures approved for the homes will result in a reduction of both electric and gas consumption. Many homes in this program have evaporative cooling and gas space heating; therefore, the program is not expected to significantly reduce TEP's summer peak load. The main benefits of the program will be the reduction of gas and electric heating bills for low-income customers.

Target Market

Promotion of the LIW Program is currently conducted by the Tucson Urban League ("TUL") and Pima County Community Services ("PCCS"). In 2006 TEP provided up to \$45,000.00 per year to PCCS and up to \$135,000.00 to TUL. The amount contributed to each agency is proportioned to the number of low-income homes within the jurisdiction of each agency. Both agencies have requested an increase in funding levels in 2007 and for all subsequent years. TEP has incorporated an increase in spending for both agencies as part of this request for program approval.

The target housing market is composed of all existing single family homes and mobile homes that receive electric service from TEP, where household income meets the guidelines established by the Arizona Department of Energy Weatherization. All participants must have household income levels at or below 150% of the poverty level. Eligible customers who are not already on the TEP's Lifeline Pricing Plan will be encouraged to participate in the Lifeline Program.

Current Baseline Conditions

Customers who meet the income guidelines established by the Arizona Department of Energy Weatherization predominately live in housing projects neighboring downtown, and branching toward the south and the southwest.

The most common type of construction found is concrete block, adobe, or slump-block; slab-on-grade, territorial style homes with single glass, hollow-core doors, minimal ceiling insulation and no wall insulation or old style, poorly insulated mobile homes. Caulking and weather-stripping as well as heating, cooling and water heating equipment will be severely degraded. Many homes will not meet even minimum code requirements for electrical, mechanical, or plumbing.

Low-Income Weatherization Program

Program Eligibility

All existing single family homes that receive electric service from TEP, with household income at or below the guidelines established by the Arizona Department of Energy Weatherization will be eligible for participation. All participants must have household income levels at or below 150% of the poverty level.

TUL, PCCS and other participating agencies will determine the customer priority based on a number of factors including but not limited to:

- No heat (winter) or no cooling (summer);
- Elderly and minor children;
- Physical handicap or illness; and
- Number of people in household.

Some agencies also conduct work related to Emergency Home Repair as funding is available. These homes may not necessarily require weatherization measures, but TEP believes they present additional opportunities for agencies to include some basic and quick installations of energy saving measures. UNSG will request installation of low-flow shower heads, faucet aerators, CFL's and hot water heater blankets, if necessary, when agencies complete Emergency Home Repair work. UNSG believes that these additions during an Emergency Home Repair visit add value to each customer and bolster energy and demand reductions.

Program Rationale

State, local and Federal funding for assistance to low-income customers falls far short of the need that currently exists. Available funding also limits the amount of dollar benefit per household, the type of work it is used for and the dollars allowed for program implementation and administration. Agencies also are limited on the number of homes they can weatherize each year because of a shortage of skilled labor to complete the necessary work, funding to add skilled labor, and the ability to find outside contractors to complete the work.

TEP's funding allows agencies to leverage other funds and complete additional home repair, equipment repair or replacement, and nominal weatherization steps that impact energy consumption. Some items authorized in the TEP LIW Program may not qualify for other funding. TEP will also allow a higher percentage of the dollars provided in the LIW to be used for labor, administration and implementation than the percentage allowed from other funding sources. As a result, agencies are better able to leverage dollars from all sources to complete more thorough repair or renovation on each home.

Program Objectives

- Allow agencies to collect up to 20% of the total job cost for Program Administration;
- Increase funding from \$2,000 per residence to \$3,000.00 per residence for weatherization, equipment repair, etc. for low-income customers or homes requiring emergency home repair for

Low-Income Weatherization Program

low-income customers within the TEP service area. Agencies may request a waiver of the \$3,000.00 limitation on a case-by-case basis;

- Increase the number of homes weatherized or the extent of repair completed at each home;
 - Lower the average household energy consumption for low-income customers; and
 - Improve the quality of life for low-income customers.
-

Products and Services Provided

A list of measures has been analyzed to determine energy and demand impact and is included as the measure level energy savings analysis in Appendix 2. This list of measures will be provided to the agencies. Agency representatives will determine from an audit or on-site analysis of the building, which items should be installed in each home.

TUL and PCCS also will conduct work related to Emergency Home Repair. These homes may not necessarily require weatherization measures, but TEP believes they present additional opportunities for agencies to include some basic and quick installations of energy saving measures such as low-flow shower heads, faucet aerators CFL's and water heater blankets, with little or no labor costs involved. TEP and agencies agree that these additions during an Emergency Home Repair visit add value to each customer and bolster energy and demand reductions.

The list of measures that participating agencies are allowed to complete with TEP funding may also include work where there is no quantifiable energy or demand savings but instead will help satisfy health and safety concerns.

Delivery Strategy and Administration

- Promotion of the LIW Program will occur through TUL and PCCS.
 - Funding will be provided to TUL and PCCS from TEP upon documentation of work completed.
 - TUL and PCCS will determine participant eligibility and priority and will complete all work.
 - TUL and PCCS will provide program administration, planning, coordination, labor, materials, equipment and entering results into tracking software.
 - The Company and participating agencies will work together to determine data collection, data input, reporting requirements and development of reporting tools.
-

Marketing and Communications

Due to the popularity of the program, DSM revenues are not allocated for advertising and promotion. When appropriate, TEP employees will continue to inform customers about the program during speaking engagements and outreach presentations. TEP does provide a page on its Web site that directs interested parties to call the TUL or PCCS. The rest of the program promotion will occur through the TUL and PCCS.

Low-Income Weatherization Program

TUL and PCCS promote the LIW Program during presentations to community organizations, leave information at neighborhood community and recreation centers, and respond to calls directed from TEP.

Program Implementation Schedule

TEP intends to continue the existing LIW Program until the implementation of any new program elements. This will provide time to transition agencies to new program elements following approval by ACC.

Table 1 shows the estimated timeline for key program activities by quarter.

Table 1. Program Implementation Schedule

Program Activities	2007				2008				2009			
Continue ongoing LIW Program												
New program pre-approval submit												
New program approval (estimated)												
Meetings/Notifications to Agencies												
Implementation by Agencies												
Process evaluation												
Savings verification												
Program redesign as needed												

Monitoring and Evaluation Plan

Since its inception in 1993, The LIW Program has generated no claims from TEP of energy or demand savings because individual measures were not tracked. Development of the new program, however, will include calculations for energy and demand savings and therefore work completed at each location will be tracked. TEP plans to pursue development of an on-line process agencies can use to provide information of each measure installed with appropriate address, dates, and other information.

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.

Low-Income Weatherization Program

- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Historic Total Program Costs

Historic program costs from the existing LIW Program since 1999 are included in Table 2.

Table 2. Historic program costs

	Total Program Costs		PTD DSM Costs	PTD Participants	
1999	\$186,596.00		\$1,081,03.00	809	
2000	\$175,487.00		\$1,256,518.00	958	
2001	\$343,191.00		\$1,599,709.00	1,163	
2002	\$185,883.00		\$1,785,592.00	1,306	
2003	\$198,594.00		\$1,984,186.00	1,430	
2004	\$192,567.00		\$2,176,753.00	1,538	
2005	\$178,925.00		\$2,355,678.00	1,631	
2006	\$200,411.00		\$2,557,089.00	1,703	

TEP will increase annual funding to the agencies from \$180,000 to \$350,000 upon approval of this program.

Program Budget (Future)

The annual budget of approximately \$381,000 will be allocated as shown in Table 3, while Table 4 provides the expected program budgets through 2012 which includes an escalation rate of 3% per year. Appendix 1 provides addition details on the 2008 budget.

Table 3. 2008 Program Budget

Total Program Budget	\$381,000
Total Administrative and O&M Cost Allocation	
Managerial & Clerical	\$19,812
Travel & Direct Expenses	\$0
Overhead	\$4,953
Total Administrative Cost	\$24,765
Total Marketing Allocation	
Internal Marketing Expense	\$0

Low-Income Weatherization Program

Subcontracted Marketing Expense	\$0
Total Marketing Cost	\$0
Total Direct Implementation	
Financial Incentives	\$350,000
Support Activity Labor	\$0
Hardware & Materials	\$0
Rebate Processing & Inspection	\$0
Total Direct Installation Cost	\$350,000
Total EM&V Cost Allocation	
EM&V / Research Activity	\$5,612
EM&V Overhead	\$624
Total EM&V Cost	\$6,235

Table 4. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total Budget	\$381,000	\$388,620	\$396,392	\$404,320	\$412,407
Incentives	\$350,000	\$357,000	\$364,140	\$371,423	\$378,851
Administrative Costs	\$31,000	\$31,620	\$32,252	\$32,897	\$33,555
Incentives as % of Budget	92%	92%	92%	92%	92%

Estimated Energy Savings

The program expects that, on average, 200 low income customers will be served annually throughout TEP service territory. The demand and energy savings from this activity are presented in Table 5. Appendix 2 provides further information about estimated energy savings for each measure, including the measure and program level benefit cost analysis. The average per site energy savings of approximately 1,114 kWh and 69 Therms are expected to reduce customer bills by \$197 annually.

Table 5. Low Income Weatherization Program Annual Energy Savings

Year	2008	2009	2010	2011	2012
Number of customers	177	181	184	188	192
Non-coincident peak (kW)	66	67	68	70	71
Coincident peak (kW)	14	14	15	15	15
Energy Savings (kWh)	197,208	201,152	205,175	209,279	213,464
Energy Savings (Therms)	12,003	12,243	12,488	12,738	12,993

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2008 – 2012 presented in Table 6.

Table 6. Projected Environmental Benefits, 2008 - 2012

Water Savings	513,139	Gallons
Sox	2,453	Lbs
NOx	4,074	Lbs
CO2	2,142,870	Lbs

Low-Income Weatherization Program

Program Cost Effectiveness

The cost effectiveness of each measure and each program as a whole was assessed using the Total Resource Cost test, the Societal Cost (SC) test and the Ratepayer Impact Measure (RIM) test as defined by the California Standard Practice Manual. Measure analysis worksheets showing all energy savings, cost and cost-effectiveness calculations are included in Appendix 2.

The cost effectiveness analysis requires estimation of:

- net demand and energy savings attributable to the program
- TEP's program administration costs
- the present value of program benefits including TEP avoided costs over the life of the measures
- TEP lost revenues

Table 7 provides a summary of the benefit/cost analysis results for this program. A detailed benefit/cost analysis is presented in Appendix 2.

Table 7. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	SC	RIM
Benefit/Cost Ratio	0.55	0.67	0.41

Table 8 provides addition program and financial assumptions, by measure category, used to derive the program level cost-benefits. Additional details for each measure category can be found in Appendix 2.

Table 8. Other Financial Assumptions

PROGRAM DATA	Lighting	Weather	Insulation	HVAC	Hot Water	Appliances	Health and Safety
Conservation Life (yrs):	5	10	20	15	5	10	15
Program Life (yrs):	5	5	5	5	5	5	5
Demand Avoided Costs (\$/kW):	109.07	116.01	128.24	122.42	109.07	116.01	122.42
Summer Energy Avoided Costs (\$/kWh):	0.0722	0.0707	0.0731	0.0722	0.0722	0.0707	0.0722
Winter Energy Avoided Costs (\$/kWh):	0.0525	0.0515	0.0531	0.0521	0.0525	0.0515	0.0521
Levelized Therms	0.8691	0.8920	0.9451	0.9194	0.8691	0.8920	0.9194
Admin. Costs:	8.86%	8.86%	8.86%	8.86%	8.86%	8.86%	8.86%
TRC Discount Rate	8.50%	8.50%	8.50%	8.50%	8.50%	8.50%	8.50%
Social Discount Rate	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%	5.00%
NTG Ratio:	100%	100%	100%	100%	100%	100%	100%

A detailed benefit/cost analysis is presented in Appendix 4.

Low-Income Weatherization Program

Appendix 1 – Program Budget

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$19,812	
Labor - Clerical	\$792	4.0%
Labor - Program Design	\$792	4.0%
Labor - Program Development	\$792	4.0%
Labor - Program Planning	\$2,972	15.0%
Labor - Program/Project Management	\$1,981	10.0%
Labor - Staff Management	\$991	5.0%
Labor - Staff Supervision	\$991	5.0%
Subcontractor Labor - Clerical	\$991	5.0%
Subcontractor Labor - Program Design	\$5,944	30.0%
Subcontractor Labor - Program Development	\$991	5.0%
Subcontractor Labor - Program Planning	\$991	5.0%
Subcontractor Labor - Program/Project Management	\$1,585	8.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$19,812</i>	<i>100.0%</i>
Travel & Direct Expenses	\$0	
Conference Fees	\$0	30.0%
Labor - Conference Attendance	\$0	20.0%
Subcontractor - Conference Fees	\$0	2.0%
Subcontractor - Travel - Airfare	\$0	4.0%
Subcontractor - Travel - Lodging	\$0	0.0%
Subcontractor - Travel - Meals	\$0	0.0%
Subcontractor - Travel - Mileage	\$0	0.0%
Subcontractor - Travel - Parking	\$0	0.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$0	8.0%
Subcontractor Labor - Conference Attendance	\$0	2.0%
Travel - Airfare	\$0	14.0%
Travel - Lodging	\$0	6.0%
Travel - Meals	\$0	3.0%
Travel - Mileage	\$0	1.0%
Travel - Parking	\$0	0.0%
Travel - Per Diem for Misc. Expenses	\$0	10.0%
<i>Travel & Direct Expenses</i>	<i>\$0</i>	<i>100.0%</i>

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Overhead (General and Administrative) - Labor and Materials	\$4,953	
Equipment - Communications	\$99	2.0%
Equipment - Computing	\$99	2.0%
Equipment - Document Reproduction	\$99	2.0%
Equipment - General Office	\$99	2.0%
Equipment - Transportation	\$99	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$50	1.0%
Labor - Accounts Receivable	\$50	1.0%
Labor - Administrative	\$50	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$50	1.0%
Labor - Contract Reporting	\$50	1.0%
Labor - Corporate Services	\$50	1.0%
Labor - Facilities Maintenance	\$50	1.0%
Labor - Information Technology	\$50	1.0%
Labor - Materials Management	\$50	1.0%
Labor - Procurement	\$50	1.0%
Labor - Regulatory Reporting	\$1,981	40.0%
Labor - Shop Services	\$50	1.0%
Labor - Telecommunications	\$50	1.0%
Labor - Transportation Services	\$50	1.0%
Office Supplies	\$50	1.0%
Postage	\$50	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%

Low-Income Weatherization Program

Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$1,734	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$4,953</i>	<i>100.0%</i>
Total Administrative Costs	\$24,765	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$0	
Advertisements / Media Promotions	\$0	0.0%
Bill Inserts	\$0	0.0%
Brochures	\$0	0.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$0	0.0%
Labor - Customer Outreach	\$0	0.0%
Labor - Customer Relations	\$0	0.0%
Labor - Marketing	\$0	0.0%
Print Advertisements	\$0	0.0%
Radio Spots	\$0	0.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$0</i>	<i>0.0%</i>
Subcontracted Marketing Expense	\$0	
Subcontractor - Bill Inserts	\$0	0.0%
Subcontractor - Brochures	\$0	0.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$0	0.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$0	0.0%
Subcontractor Labor - Customer Outreach	\$0	0.0%
Subcontractor Labor - Customer Relations	\$0	0.0%
Subcontractor Labor - Marketing	\$0	0.0%
Television Spots	\$0	0.0%
Website Development	\$0	0.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$0</i>	<i>0.0%</i>
Total Marketing/Advertising/Outreach	\$0	
Direct Implementation		

Low-Income Weatherization Program

Financial Incentives to Customers	\$350,000	
Activity - Labor	\$0	
Labor - Curriculum Development	\$0	8.0%
Labor - Customer Education and Training	\$0	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$0	30.0%
Subcontractor Labor - Facilities Audits	\$0	10.0%
Subcontractor Labor - Curriculum Development	\$0	5.0%
Subcontractor Labor - Customer Education and Training	\$0	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$0	2.0%
<i>Subtotal Activity</i>	<i>\$0</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$0	
Audit Applications and Forms	\$0	8.0%
Direct Implementation Literature	\$0	20.0%
Education Materials	\$0	20.0%
Energy Measurement Tools	\$0	10.0%
Installation Hardware	\$0	10.0%
Subcontractor - Direct Implementation Literature	\$0	4.0%
Subcontractor - Education Materials	\$0	4.0%
Subcontractor - Energy Measurement Tools	\$0	16.0%
Subcontractor - Installation Hardware	\$0	6.0%
Subcontractor - Audit Applications and Forms	\$0	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$0</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$0	
Billing Assistance	\$0	100.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$0	0.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$0	0.0%
Subcontractor Labor - Field Verification	\$0	0.0%
Subcontractor Labor - Rebate Processing	\$0	0.0%
Subcontractor Labor - Site Inspections	\$0	0.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$0</i>	<i>100.0%</i>
Total Direct Implementation	\$350,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$5,612	
Labor - EM&V	\$281	5.0%
Materials - EM&V	\$281	5.0%
Subcontractor Labor - EM&V	\$5,050	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$5,612</i>	<i>100.0%</i>

Low-Income Weatherization Program

EM&V Overhead	\$624	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$312	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$312	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$624</i>	<i>100.0%</i>
Total EM&V	\$6,235	
Total Budget	\$381,000	

Low-Income Weatherization Program

Appendix 2 – Benefit/Cost Analysis

See accompanying Excel spreadsheet for program additional benefit/cost calculations.

LAND/ENERGY SAVINGS				INCENTIVE CALCULATIONS							CUSTOMER COST/SAVINGS			
	Non Coin. Demand Savings (kW)	Summer Energy Savings (KWh)	Winter Energy Savings (KWh)	Energy Savings (Therms)	IRP PV Benefit		Social PV Benefit		PV Program Cost (\$)	NPV (\$)	Incr. Cost (\$)	Cost Savings		Payback w/Incr. (\$/yr)
					(\$)	(\$)	(\$)	% PV				(\$)	(\$)	
Measure Description	0.275	143.82	143.82	0.00	\$206.67	\$227.06	\$72.40	35%	\$79	\$128	\$72.40	\$26	2	
	0.000	19.52	19.52	22.60	\$149.40	\$175.82	\$240.80	161%	\$262	-\$113	\$240.80	\$35	6	
	0.000	116.68	116.68	9.73	\$239.62	\$315.55	\$257.66	108%	\$280	-\$41	\$257.66	\$35	7	
C Total	0.070	216.71	92.88	14.08	\$372.18	\$465.19	\$911.20	245%	\$992	-\$620	\$911.20	\$48	18	
	0.000	8.37	8.37	17.10	\$63.08	\$69.30	\$208.43	330%	\$227	-\$164	\$208.43	\$25	8	
Electric Hot Water Total	0.026	113.79	113.79	1.00	\$127.42	\$149.96	\$247.75	194%	\$270	-\$142	\$247.75	\$22	11	
	0.000	0.00	0.00	3.29	\$25.08	\$31.35	\$38.75	155%	\$42	-\$17	\$38.75	\$5	8	
					\$1,183.45	\$1,434.24	\$1,976.99	1228%	\$2,152	-\$969	\$1,976.99	\$197	63	
All Projects					0.371	618.89	495.05	67.80						

DEMAND/ENERGY SAVINGS	TRC
Measure	
Description	BC Ratio
Lighting Total	2.62
Weatherization Total	0.57
Insulation Total	0.85
HVAC Total	0.38
Domestic Hot Water Total	0.28
Appliances Total	0.47
Health and Safety	0.59
Total All Projects	0.55

Low-Income Weatherization Program

Key per Site benefit – cost model

DEMAND/ENERGY SAVINGS AND COSTS										
Measure	Cost	Cost	Non-	Coin.	Energy	Energy	Coin.	Energy	Energy	Incr.
Description	Unit	Units	Demand	Savings	Savings	Savings	Factor	Savings	Savings	Cost
		per	(KW)	(KW)	(Therms)	(KW)		(KW)	(Therms)	(\$)
LIGHTING MEASURES										
- Standard CFL	Lamp	1	0.052	10%	56.94	0	10%	56.94	0	\$13.80
- 3-way CFL	Lamp	1	0.070	10%	60.05	0	10%	60.05	0	\$16.20
- R-30 and R-40	Lamp	1	0.067	10%	57.47	0	10%	57.47	0	\$14.50
- 3w and 7w	Lamp	1	0.018	10%	15.44	0	10%	15.44	0	\$7.00
- Torchiere lamp	Lamp	1	0.245	10%	268.28	0	10%	268.28	0	\$65.00
- Nite Lite/Lime Lite	Lamp	1	0.007	10%	25.45	0	10%	25.45	0	\$5.00
Weighted Average Lighting			0.275		287.633	0.000		287.633	0.000	\$72.40
WEATHERIZATION MEASURES										
Interior/Exterior Caulking	per site	1	0.00		0.59	0.009		0.59	0.009	\$52.00
Aerosol Foam Sealant	per site	1	0.00		1.05	0.017		1.05	0.017	\$52.00
Door Weatherstrip	per unit	1	0.00		0.60	0.010		0.60	0.010	\$53.00
Window Weatherstrip	per inch	100	0.00		13.98	22.206		13.98	22.206	\$10.00
Door Sweep	per unit	2	0.00		16.68	0.266		16.68	0.266	\$46.00
Replace standard hollow door with insulated door	per door	1	0.00		13.91	0.209		13.91	0.209	\$93.00
Replace broken single-pane windows with double pane/low e window (need energy impact)	per sq ft	9	0.00		10.82	0.162		10.82	0.162	\$153.00
Weighted Average Weatherization			0.000		39.048	22.599		39.048	22.599	\$240.80
INSULATION MEASURES										
Attic Insulation										
-Blown cellulose, unfloored										
R-11	Per Sq.Ft.	1000	0.00		295.48	12.331		295.48	12.331	\$270.00
R-15	Per Sq.Ft.	1000	0.00		253.97	10.400		253.97	10.400	\$270.00
R-19	Per Sq.Ft.	1000	0.00		252.36	10.278		252.36	10.278	\$270.00
R-23	Per Sq.Ft.	1000	0.00		226.30	9.338		226.30	9.338	\$270.00
R-27	Per Sq.Ft.	1000	0.00		222.25	9.193		222.25	9.193	\$270.00
R-30	Per Sq.Ft.	1000	0.00		222.06	9.196		222.06	9.196	\$270.00
R-34	Per Sq.Ft.	1000	0.00		205.88	8.521		205.88	8.521	\$270.00

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R-38	Per Sq.Ft.	1000	0.00	0.00	195.88	8.090	\$270.00
-Blown cellulose, floored							
R-14	Per Sq.Ft.	1000	0.00	0.00	259.26	10.905	\$270.00
R-18	Per Sq.Ft.	1000	0.00	0.00	254.83	10.559	\$270.00
R-22	Per Sq.Ft.	1000	0.00	0.00	234.38	9.628	\$270.00
R-26	Per Sq.Ft.	1000	0.00	0.00	225.95	9.329	\$270.00
R-30	Per Sq.Ft.	1000	0.00	0.00	222.06	9.196	\$270.00
-Fiberglass, batts							
-R13	Per Sq.Ft.	1000	0.00	0.00	267.37	11.310	\$270.00
-R19	Per Sq.Ft.	1000	0.00	0.00	248.92	10.391	\$270.00
-R30	Per Sq.Ft.	1000	0.00	0.00	222.06	9.196	\$270.00
-R38	Per Sq.Ft.	1000	0.00	0.00	195.88	8.090	\$270.00
Floor Insulation Fiberglass							
-R19 - including supports (batt hangers or twine)	Per Sq.Ft.	500	0.00	0.00	134.53	5.032	\$135.00
-R30 - including supports (batt hangers or twine)	Per Sq.Ft.	500	0.00	0.00	120.40	4.953	\$135.00
Add R5 duct insulation to gas heat/ elect AC (or coat to similar R value)	Per home	1	0.00	0.00	24.83	10.558	\$132.00
Add R5 duct insulation to elect heat/ elect AC (or coat to similar R value)	Per home	1	0.00	0.00	255.28	0.000	\$132.00
Sidewall Insulation (Blown In)							
- Asbestos Shingled	Per Sq.Ft.	500	0.00	0.00	118.75	6.042	\$135.00
- Asphalt / Wood Siding	Per Sq.Ft.	500	0.00	0.00	118.75	6.042	\$135.00
- Stucco Siding	Per Sq.Ft.	500	0.00	0.00	118.75	6.042	\$135.00
Unfinished Wall Insulation							
- R19 Fiberglass	Per Sq.Ft.	200	0.00	0.00	106.81	5.468	\$54
Weighted Average Insulation			0.000	0.000	233.354	9.731	\$257.66
HVAC MEASURES							
Full tune-ups of Furnace, Central A/C and Heat pumps	Per home	1	0.00	0.00	303.82	4.130	\$300.00
Central A/C Filter (cleaning or replacement)	Per home	1	0.00	0.00	121.47	1.377	\$35.00
Central A/C Coil (cleaning)	Per home	1	0.00	0.00	121.47	0.551	\$250.00
Sealing ducts with mastic	Per home	1	0.00	0.00	22.36	3.146	\$282.46
Window/wall AC Filter (cleaning or replacement)	Per home	1	0.00	0.00	50.76	0.000	\$35.00
Electric Heating System Thermostat (digital, line voltage)	Per home	1	0.00	0.00	180.32	0.000	\$98.00
Gas Heating System Thermostat (digital, line voltage)	Per home	1	0.00	0.00	0.00	11.841	\$126.00
Install 80 AFUE Furnace, increase AFUE by 15%	Per home	1	0.00	0.00	0.00	27.261	\$1,870.00
Solar Screen	Per home	1	0.00	0.00	22.95	0.084	\$225.00
Install attic ventilation (only with AC)	Per home	1	0.09	0	0.00	0.000	\$450.00
Replace Single Speed cooler motor with 2-speed motor (1/3 - 1/2)	Per home	1	0.18	0	0.00	0.000	\$210.00
Replace Single Speed cooler Motor with 2-speed motor (3/4)	Per home	1	0.18	0	0.00	0.000	\$230.00
Plant trees on South and West Exposure (use 0.57 kW and 128 kWh annually per tree)	Per home	1	0.18	1	117.49	0.275	\$63.00
Weighted Average HVAC			0.070	0.026	309.585	14.082	911.198
DOMESTIC HOT WATER MEASURES							

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Water-saving Showerhead w /Massage (with shutoff 2.5 gpm or less)	1	0.00	0.00	0.00	0.00	9.968	\$25.03
Water-saving Hand Held Showerhead (with shutoff 2.5 gpm or less)	1	0.00	0.00	0.00	0.00	9.968	\$23.03
Water Heater Insulation Blanket	1	0.00	0.00	0.00	0.00	5.600	\$32.40
High Efficiency Water Heater - Gas, EF = 0.63	1	0.00	0.00	0.00	0.00	14.400	\$449.00
High Efficiency Water Heater - Elect, EF = 0.93	1	0.00	0.00	0.00	93.00	0.000	\$449.00
Faucet Flow restrictor	2	0.00	0.00	0.00	0.00	6.152	\$15.10
Domestic Hot Water Pipe Insulation (seal all seams and joints; duct tape not permitted)	1	0.00	0.00	0.00	0.00	2.848	\$12.00
Weighted Average Domestic Hot Water		0.000	0.000	0.000	16.740	17.103	208.428
APPLIANCES MEASURES							
15 c.f.	1	0.05	1	0.05	474.50	2.500	\$478.00
18 c.f. w/ice	1	0.06	1	0.06	511.00	2.500	\$645.00
18 c.f. w/o ice	1	0.06	1	0.06	511.00	2.500	\$645.00
21 c.f. w/ice	1	0.08	1	0.08	689.85	2.500	\$688.00
21 c.f. w/o ice	1	0.08	1	0.08	689.85	2.500	\$688.00
Weighted Average Appliances		0.026		0.026	227.578	1.000	247.750
HEALTH, SAFETY & MISCELLANEOUS MEASURES							
Install CO2 Sensor	1	0.00	1	0.00	0.00	0.000	\$85.00
Repair/replace all connections related to installation and operation of evaporative cooler (no impact)	1	0.00	1	0.00	0.00	0.000	\$150.00
Gas leak repair	1	0.00	1	0.00	0.00	65.700	\$50.00
Weighted Average H&S		0.000		0.000	0.000	3.285	38.750

Key per measure benefit – cost metrics

Per Unit						
DEMAND/ENERGY SAVINGS		Non-Coin.	Coin.	Energy Savings	Energy Savings	Incr. Cost
Measure	Unit	Demand Savings (KW)	Demand Savings (KW)	(KWWh)	(Therms)	(\$)
LIGHTING MEASURES						
- Standard CFL		0.052	75%	56.94	0	13.80
- 3-way CFL		0.070	75%	60.05	0	16.20
- R-30 and R-40		0.067	75%	57.47	0	14.50

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- 3w and 7w	0.018	75%	0.01	15.44	0	7.00
- Torchier lamp	0.245	75%	0.18	288.28	0	65.00
- Nite Lite/Lime Lite	0.007	75%	0.01	25.45	0	5.00

WEATHERIZATION MEASURES						
Interior/Exterior Caulking	per site	0.00	0.00	0.59	0.01	\$52.00
Aerosol Foam Sealant	per site	0.00	0.00	1.05	0.02	\$52.00
Door Weatherstrip	per	0.00	0.00	0.60	0.01	\$53.00
Window Weatherstrip	united inch	0.00	0.00	0.14	0.22	\$0.10
Door Sweep		0.00	0.00	8.34	0.13	\$23.00
Replace standard hollow door with insulated door		0.00	0.00	13.91	0.21	\$93.00
Replace broken single-pane windows with double pane/low e window (need energy impact)	per sq ft	0.00	0.00	1.20	0.02	\$17.00

INSULATION MEASURES						
Attic Insulation						
-Blown cellulose, unfloored						\$0.27
R-11	Per Sq.Ft.	0.00	0.00	196.99	2.06	\$0.27
R-15	Per Sq.Ft.	0.00	0.00	169.31	1.73	\$0.27
R-19	Per Sq.Ft.	0.00	0.00	168.24	1.71	\$0.27
R-23	Per Sq.Ft.	0.00	0.00	150.87	1.56	\$0.27
R-27	Per Sq.Ft.	0.00	0.00	148.17	1.53	\$0.27
R-30	Per Sq.Ft.	0.00	0.00	148.04	1.53	\$0.27
R-34	Per Sq.Ft.	0.00	0.00	137.26	1.42	\$0.27
R-38	Per Sq.Ft.	0.00	0.00	130.59	1.35	\$0.27
-Blown cellulose, floored						
R-14	Per Sq.Ft.	0.00	0.00	172.84	1.82	\$0.27
R-18	Per Sq.Ft.	0.00	0.00	169.88	1.76	\$0.27
R-22	Per Sq.Ft.	0.00	0.00	156.25	1.60	\$0.27
R-26	Per Sq.Ft.	0.00	0.00	150.63	1.55	\$0.27

Low-Income Weatherization Program

R-30	Per								
-Fiberglass, batts	Sq.Ft.	0.00	0.00	148.04	1.53	\$0.27			
-R13	Per								
	Sq.Ft.	0.00	0.00	178.25	1.88	\$0.27			
-R19	Per								
	Sq.Ft.	0.00	0.00	165.95	1.73	\$0.27			
-R30	Per								
	Sq.Ft.	0.00	0.00	148.04	1.53	\$0.27			
-R38	Per								
	Sq.Ft.	0.00	0.00	130.59	1.35	\$0.27			
Floor Insulation Fiberglass									
-R19 - including supports (batt hangers or twine)	Per								
	Sq.Ft.	0.00	0.00	89.69	0.84	\$0.27			
-R30 - including supports (batt hangers or twine)	Per								
	Sq.Ft.	0.00	0.00	80.27	0.83	\$0.27			
Add R5 duct insulation to gas heat/ elect AC (or coat to similar R value)									
Add R5 duct insulation to elect heat/ elect AC (or coat to similar R value)									
		0.00	0.00	24.83	10.56	\$132.00			
		0.00	0.00	255.28	0.00	\$132.00			
Sidewall Insulation (Blown In)									
- Asbestos Shingled	Per								
	Sq.Ft.	0.00	0.00	79.16	1.01	\$0.27			
- Asphalt / Wood Siding	Per								
	Sq.Ft.	0.00	0.00	79.16	1.01	\$0.27			
- Stucco Siding	Per								
	Sq.Ft.	0.00	0.00	79.16	1.01	\$0.27			
Unfinished Wall Insulation									
- R19 Fiberglass	Per								
	Sq.Ft.	0.00	0.00	71.21	0.91	\$0.27			
HVAC MEASURES									
Full tune-ups of Electric Furnace, Central A/C and Heat pumps by Comfort Partners qualified technician with invoice attached.									
Central A/C Filter (cleaning or replacement)									
Central A/C Coil (cleaning)									
Sealing ducts with mastic									
Window/Door AC Filter (cleaning or replacement)									
Electric Heating System Thermostat (digital, line voltage)									
Setback Thermostat									
Furnace									
Solar Screen									
Install attic ventilation (only with AC)									
Replace Single Speed cooler motor with 2-speed motor (1/3 - 1/2)									
Replace Single Speed cooler Motor with 2-speed motor (3/4)									

Low-Income Weatherization Program

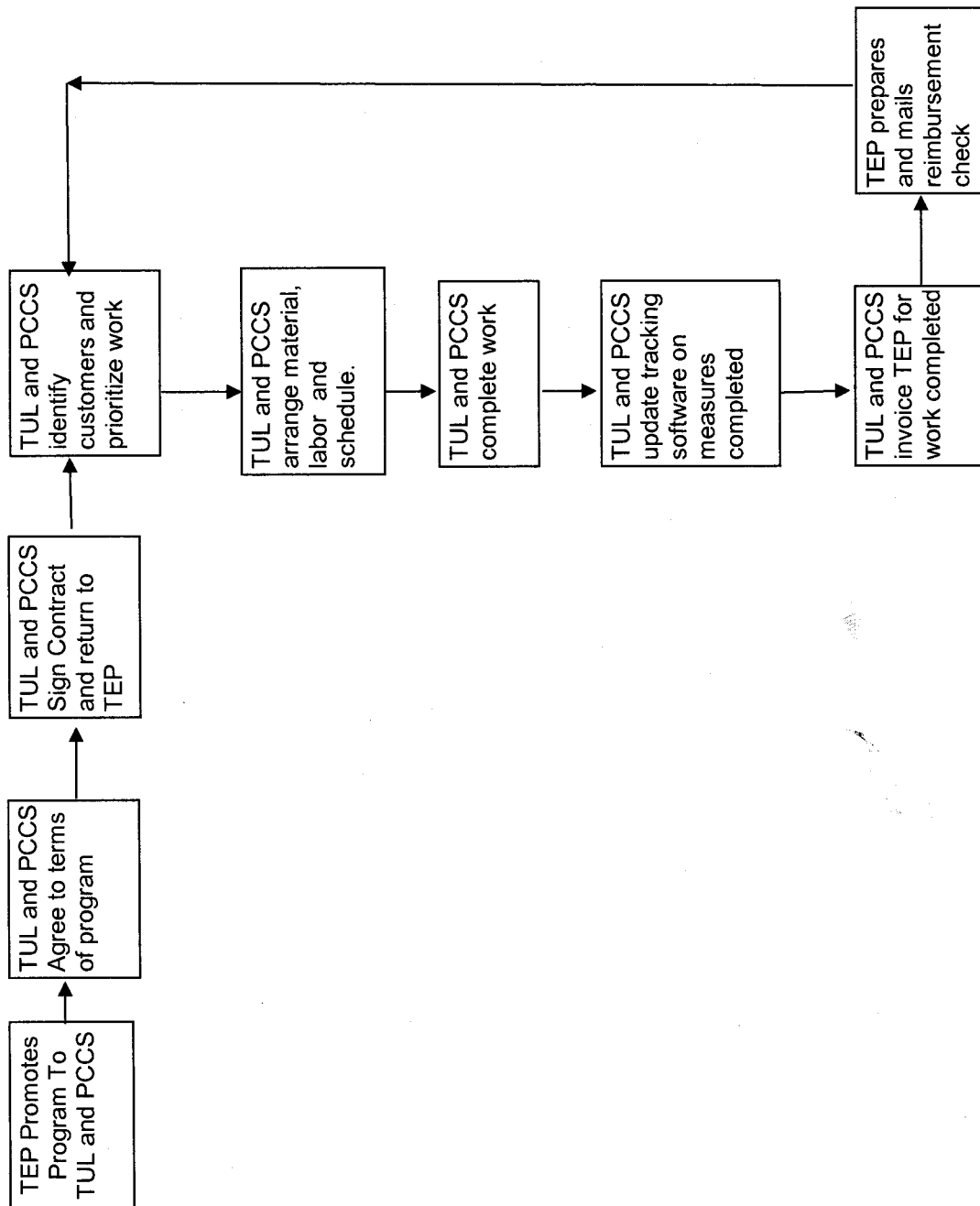
Plant trees on South and West Exposure (use 0.57 kW and 128 kWh annually per tree)					
	0.18	0.52	117.49	0.28	\$63
DOMESTIC HOT WATER MEASURES					
Water-saving Showerhead w /Massage (with shutoff 2.5 gpm or less)	0.00	0.00	308.25	9.97	\$25
Water-saving Hand Held Showerhead (with shutoff 2.5 gpm or less)	0.00	0.00	308.25	9.97	\$23
Water Heater Insulation Blanket	0.00	0.00	167.44	5.60	\$32
High Efficiency Water Heater - Gas, EF = 0.63	0.00	0.00	0.00	14.40	\$449
High Efficiency Water Heater - Elect, EF = 0.93	0.00	0.00	93.00	0.00	\$449
Faucet Flow restrictor	0.00	0.00	71.97	3.08	\$8
Domestic Hot Water Pipe Insulation (seal all seams and joints; duct tape not permitted)	0.00	0.00	104.08	2.85	\$12
APPLIANCES MEASURES					
15 c.f.	0.054	1	0.054	474.50	2.50 \$478
18 c.f. w/ice	0.058	1	0.058	511.00	2.50 \$645
18 c.f. w/o ice	0.058	1	0.058	511.00	2.50 \$645
21 c.f. w/ice	0.079	1	0.079	689.85	2.50 \$688
21 c.f. w/o ice	0.079	1	0.079	689.85	2.50 \$688
HEALTH, SAFETY & MISCELLANEOUS MEASURES					
Install CO2 Sensor	0.058	1	0.000	0.00	0.00 \$85
Repair/replace all connections related to installation and operation of evaporative cooler (no impact)	0.058	1	0.000	0.00	0.00 \$150
Gas leak repair	0.000		0.000	0.00	65.70 \$50

TEP LIW Rate

Rate	2006 Rev	2006 kWh sales	Ave \$/kWh
RT 1 Regular	\$323,237,704	3,527,134,616	\$0.09164

Low-Income Weatherization Program

Appendix 3 – Low Income Weatherization Program Implementation Process



Attachment 4

Residential New Construction Program

Attachment 4

Residential New Construction Program

Residential New Construction Program

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TEP Residential New Construction Program

Program Concept and Description

Tucson Electric Power Company ("TEP") proposes to continue the successful and very popular TEP Residential New Construction Program introduced in 1997 and currently marketed as the TEP Guarantee Home Program. This program emphasizes the whole-house building approach to improving health, safety, comfort, durability and energy efficiency. The program includes on-site inspections and field testing of homes to verify that homes actually perform the way they were designed. Program standards were designed to focus solely on best-case practice. Participating builders are trained to apply building science principles to assure that high-efficiency homes also have superior comfort. Program standards are displayed in Appendix 1.

Guarantee Option – TEP actively promotes the Guarantee Home Program ("GHP"). TEP is able to simulate costs and guarantee the cost of operation when builders choose electricity as the fuel source. The GHP has both prescriptive and performance elements that must be met before a home can actually be guaranteed. When homes pass all performance inspections and performance testing required, TEP will guarantee the cost for heating and cooling for five years. TEP also provides a written guarantee on comfort for these homes. Comfort for this purpose is defined as: 1) equipment is sized and installed to provide interior temperatures that are 30 degrees cooler than exterior temperatures at design temperatures for Tucson and 2) equipment is sized and installed to maintain interior temperatures and humidity within the range of comfort for the comfort chart published by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE).

Due to the improved load curve with electric equipment selection, homes built to the GHP standards also qualify for Rate 201. The GHP encourages builders to exceed standards whenever possible and to consider installation of alternative types of water heating or solar. The Rate 201 C rewards home builders (through market differentiation) and homeowners (through reduced rates) who install renewable energy sources into their design. Builders using GHP standards and the electric equipment option are paid a minimum incentive to help off-set costs. A portion of this helps offset incremental cost of additional framing detail and installation of return-air-paths required to pass pressure testing as part of the performance requirement. The balance helps in advertising or marketing costs as the TEP GHP logo is required on all advertisements for the subdivision.

Non-Guarantee Option - TEP is not able to guarantee the cost of operation when builders choose a fuel source other than electricity or if the builder does not pass all performance inspections and testing required. Homes built to the TEP Residential New Construction Program Standards that have natural gas space heating and water heating do not qualify for the guarantee. The list of construction standards is the same because TEP understands the importance of pressure management and air flow. However, because TEP will not guarantee the actual performance of these homes, builders are not required to install all framing measures or return-air-paths to receive the Non-Guarantee Certification. Homes built with the Non-Guarantee option must pass the duct leakage standards and they must pass an insulation inspection to meet prescriptive requirements. Homeowners receive certification that duct leakage has been kept to a pre-set minimum and that insulation has been installed properly. There is no separate promotion by TEP, no allowance for the builder to add the TEP logo to their advertisements for the subdivision, and no builder incentives are paid. It is important to note that builders have the choice of participating in a similar program offered by other local utilities. These other programs provide less support, less testing, and no incentive is offered to the builders.

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Due to the popularity of the guarantee option, all future references to this program will be to GHP – Guarantee Option.

Homebuilders actively embrace the guarantee concept. They prefer the market differentiation, the guaranteed operating cost, and the separate rate design over competitors who do not offer a guarantee. Homebuilders use the GHP as a marketing tool and recognize the benefit of full performance inspections and testing. They consider TEP to be an active partner and an extension of their work force. The level of testing and inspections provided by TEP provides information that is suggested to protect against some popular claims on construction defects. As a result the majority of all homes constructed by builders and owner/builders participating in the TEP Residential New Construction Program have been constructed under the Guarantee option.

TEP has provided training and education about building science and the whole-house approach to building homes since 1997. The program will continue to offer education and training for homebuyers, builders, sub-contractors, and Realtors/builder sales agents. Training is aimed at increasing the applied knowledge of building science and energy-efficient building practices to transform the market and improve construction practices in the Tucson area. The program will offer training opportunities and supplement national trainers with local training resources when possible.

The original Residential New Construction Program operated initially under the Good Cents name. TEP worked with builders to convey the advantages of the higher standards and the necessity of performance testing and inspections contained in the GHP. Phase-out of the Good Cents Program and phase-in of the GHP was completed in 1999. Historic program participation is shown in Table 1.

Table 1. Historic GHP Participation

Year	TEP Service Area Building Permits	Actual Commitments to GHP	Percentage of Guarantee Homes to TEP SA Total
1997	Not Tracked	36	Pilot Program
1998	Not Tracked	90	Pilot Program
1999	Not Tracked	562	1 st Year Actual Program
2000	6584	1422	21.5%
2001	6430	1433	22.3%
2002	6324	2047	32.3%
2003	6500	2178	33.5%
2004	6100	3189	52.2%
2005	7887	3862	49.0%
2006	6198	3334	53.8%
Total Commitments before amendments		18153	
Total Commitments EOY 2006 after amendments		15862	

End-of-year (EOY) adjustments are made in the semi-annual DSM reports for this program to show amendments to prior year contracts. Amendments may occur when builders sell land-options, when they file bankruptcy, or when mergers occur. There were 2,291 negative adjustments to contracts signed from 1997 through 2006. Actual commitments after adjustments EOY 2006 were 15,862.

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Target Market

The target market is composed of all newly-constructed single family homes that receive electric service from TEP. This includes production home developments, town home and condominium projects where individual units are sold to homeowners, and custom home projects. The program will be promoted to all builders within the TEP service territory. As noted above, only homes with electric space and water heating are eligible for the Guarantee Option.

Current Baseline Conditions

Tucson and Pima County are made up of six jurisdictions that regulate minimum code requirements for new home construction. Since 1997, minimum code requirements have changed. The most significant change in code requirements impacting energy consumption occurred with the adoption and recent enforcement of IECC 2003. Unfortunately, even when minimum code requirements increase, it is unlikely that homes will actually perform the way they are designed to perform. This occurs because of the inconsistency in construction practice due to turnover in the labor force, the lack of training, the lack of installation standards for items impacting energy use, and the absence of systematic field performance testing. TEP provides inspections and testing to assure program standards are met and to assure the home actually performs as designed.

In the greater Tucson metropolitan area within the TEP service territory, the housing market is dominated by production home builders. Outside the metro area, the market includes pockets of production home building in growth areas such as Vail, Sonoita, Marana, and Oro Valley. In most other areas the market is dominated by custom and manufactured homes. Much of the growth in Pima County occurs in areas that do not receive electric service from TEP. In 2006, studies completed for TEP show that only 77% of the new home permits in Pima County occurred within the TEP area. Homes constructed outside the TEP service area are not offered TEP's Residential New Home Program.

Program Eligibility

In order to be eligible for the program, builders and projects must meet the following requirements:

- Eligible projects are newly-constructed residential single family residences (including town homes, condominiums, and duplexes) each served by an individual electric meter;
 - New homes must be located within the TEP certificated service area; and
 - In order to be eligible for the Guarantee Option and its benefits and incentives, homes must have electric space and water heat.
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Program Rationale

The pace of residential new construction in the TEP service territory, particularly in Pima County is one of the biggest drivers of TEP's system load growth. It is useful to offer this type of energy efficiency program as the load will continue to be present on TEP's system for more than 50 years after initial construction. Greater savings can be achieved and it is much easier and more cost effective to work with

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builders to implement energy efficiency at the time of construction rather than attempt to retrofit efficiency after a home has been built. For many new home measures such as building envelope improvements, the benefits of energy-efficiency upgrades will be sustained for the life of the home to produce cost effective savings. Table 2 shows projected permits and program participation through 2012.

Table 2. Projected New Home Construction Permits and in GHP Program Participation

Year	2008	2009	2010	2011	2012
Projected Number of Permits	9,000	9,800	10,400	10,900	11,300
TEP Territory %	77%	75%	70%	65%	60%
TEP Territory	6,930	7,350	7,280	7,085	6,780
Projected GHP Program %	60%	60%	60%	60%	60%
Projected GHP participants	3,545	4,410	4,368	4,251	4,068

Program Objectives

The objectives of the program are to:

- Reduce peak demand and overall energy consumption in new homes;
- Increase new home energy efficiency standards to GHP Standards in a minimum of 60% of new homes constructed in TEP service territory;
- Increase GHP construction standards to include an option for higher efficiency HVAC;
- Retain existing builder participation and encourage the participation of new builders;
- Increase the overall number and penetration of homes built to program standards;
- Stimulate construction of new homes that are inspected and tested to assure energy performance;
- Promote upgrades to renewable resources to improve whole house efficiency performance;
- Assist builder sales agents with promoting and selling energy-efficient homes;
- Provide information to help explain the benefits of energy efficient features;
- Train builder construction staff and subcontractors in advanced building science concepts to increase energy efficiency through improved design and installation practices; and
- Increase homebuyer awareness and understanding of energy-efficient building practices and the benefits of purchasing an energy efficient home.

Products and Services

Products and services include the advertisement and promotion focused on builders and subdivisions that meet or exceed TEP GHP Standards. A copy of the standards is included in Appendix 1. Products and service offered through the program include:

- Optional GHP standards to include upgrade to higher efficiency HVAC equipment. A copy of the standards is included in Appendix 1;
- Builder and contractor education and training;

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- Homebuyer and realtor/sales agent awareness and education materials;
- Consumer training sessions for homeowners who purchase TEP Guarantee Homes;
- Pre-construction meetings with builders and sub-contractors prior to the start of a development;
- On-site inspections and testing of each home constructed to program standards;
- Guaranteed heating and cooling costs and comfort – provided to homeowner for 5 years: (comfort is defined in Program Concept and Description section of this report);
- Rate 201 – remains with the home. See Note 2 below; and
- Builder incentives for meeting TEP GHP Standards and advertising requirements. See Table 3 below and Note 1 below. The average per home incentive for builders, based on the projected configuration of homes to be built during the 2008 – 2012 program cycle will be approximately \$470.

Table 3. GHP Program Incentives

TEP Guarantee Home Program Incentives	
Meets GHP standards, passes all inspections/ testing to meet performance standard and builder adheres to advertising requirements.	\$400 per home
Meets GHP standards, passes all inspections/ testing to meet performance standard plus 14 SEER HVAC and builder adheres to advertising requirements.	\$550 per home

Note 1: Incentive levels and other program elements will be reviewed and modified as needed during subsequent years from the approval date of this program. Such modifications will be reported in the mid-year and year-end reports submitted to Staff. Incentives were higher on a per-home basis during early program years to incent builders to use higher construction standards. Incentives have been adjusted downward each year. The current incentive level is shown in the following table and will be used in the program benefit/cost Analysis.

Note 2: Rate 201, approved by the ACC in December 1997, provides a special rate option on residences built to the GHP standards and that also have electric heat pumps and electric water heaters. The rate is structured to provide three options. On February 20, 2003, the ACC approved changes in the Rate 201 pricing plan language.

Delivery Strategy and Administration

The program delivery and administration strategy is as follows:

- This program is managed in house by TEP.
- TEP provides program administration, marketing, planning, coordination of builder and contractor training and consumer education activities and all inspections, testing and technical assistance.
- Some program activities such as training, inspections and other program support may also be provided through specialized vendors or supplemental work force units under the direction of TEP.

Key trade ally and sub-contractor relationships include:

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- Building Science trainers – training and education;
- HVAC Contractors – sizing, installation and start-up of HVAC systems;
- Framing Contractors – framing and blocking detail to enhance insulation performance;
- Insulation Contractors – insulation installed according to specifications;
- Outside Contractor – load calculation from plans;
- Inspections and testing – Southwest Energy Solutions, supplemental work force; and
- The Arizona Energy Office – training, education and awareness.

A Program implementation flow chart is included in Appendix 2.

Marketing and Communications

In the first few years of the program marketing and communications focused on product and brand recognition. As the program matured, the marketing and communications focused more on the guaranteed heating and cooling costs, the value of inspections and testing and the available electric rate. The following is the Marketing Plan for 2006:

Guarantee Home Marketing Plan – 2006

Concept

Developed by TEP's energy experts, GHP Homes are uniquely designed as a complete system, where every component works in harmony to benefit health, safety, comfort, durability, energy efficiency, and the lowest electric rate to the homeowner. TEP inspects every home during the construction process to ensure strict equipment and construction requirements are met. Then the homeowner gets a guarantee in writing that their home will perform as promised.

Sales Objectives - 50% market share of all new homes built in service territory.

Target Market - New home buyers and new home builders (Custom to large production).

Competition - Non-Guarantee Homes.

Marketing Strategies - The goal for marketing the GHP is to educate the consumer on energy efficient building standards to drive consumer pull for energy efficient new homes. As more consumers demand the product more builders will choose to build to GHP standards. Higher builder participation results in higher quality, more energy efficient electric homes being built in the TEP service territory.

Advertising Message -Guarantee Homes are built to superior construction standards that promote health, safety, comfort, durability and a lower electric rate than in an ordinary home.

Marketing Plan - Include the GHP message in as many communications as possible. We plan to use GHP marketing on inspector vans, builder collateral, bill messages, bill inserts, Web site, TEP vehicles, sponsorships, training seminars for current and potential GHP homeowners, training CDs for sales professionals, call center on-hold messages, builder field guides, model home signage, and through public relations with the local news media.

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Media Plan - A diversified media mix to increase reach and frequency aiming for the highest coverage of largest number of households. Most advertising will occur from May through August, which is consistent with new home sales patterns. TEP will utilize channels that new home buyers tend to use when searching for their next home and concentrate on the channels with the highest recall (TV, Radio and Print). Below is a list by media type and the percentage of the overall media budget dedicated to the channel. Around 15% of the total budget covers production expenses, and 85% covers media purchases.

- Radio – 5.83% (metro and traffic)
- Television – 50.83% (network and cable)
- Newspaper – 39.66% (large and small publications, location based)
- Trade - .68%

Program Implementation Schedule

TEP will continue the existing GHP until the implementation of any new program elements. We will provide time to transition builders to new program elements as needed. Table 4 below shows the estimated timeline for key program activities by quarter.

Table 4. Implementation Schedule

Program Activities	2007				2008				2009			
Continue ongoing GHP program												
Submit new program to ACC												
New program approval (estimated)												
Modify marketing material as required												
Implementation of new program elements												
Process evaluation												
Savings verification												
Program redesign as needed												

Monitoring and Evaluation Plan

In March of 1999, TEP contracted with Energy Simulation Specialists to complete a comprehensive analysis on the expected savings gained from the GHP standards compared to current market conditions and building practices at that time. This analysis provides the basis for energy and capacity savings claimed from 1999 – 2006. Actual test data can be used to verify performance and compliance because TEP conducts in-house duct-blast tests, blower-door tests, insulation inspections, framing inspections, and final testing to include HVAC performance and pressure management on homes constructed in the program. The updated 2007 study by Enovity comparing homes built to GHP standards to IECC 2003 has been used to calculate energy and demand reduction on an on-going basis. It has been assumed that the higher builder incentive offered for 14 SEER equipment will apply to 20% of the homes in 2008 and will ramp up during later years.

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- Database management - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.

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- Integrated implementation data collection - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- Field verification – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- Tracking of savings using deemed savings values - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Program Costs

Table 7 provides the 2008 program budget, and is based on historic program allocations. Builder incentives included in the budget below are calculated on the number of homes committed each year as a proxy for the contracts that will be expensed (see explanation below). Table 8 provides the projected program outyear budgets through 2012. Appendix 3 provides addition details on the historic and 2008 budget.

Table 5. 2008 Program Budget

Budget Item	2008 Budget	% allocations
2008 program budget	\$3,200,000	100.0%
Planning & Administration	\$115,652	3.6%
Program Management, Marketing, and Advertising	\$383,838	12.0%
Program Implementation	\$398,357	12.4%
Planned 2008 incentive allocation	\$1,661,081	51.9%
Training and Technical	\$632,850	19.8%
Consumer Education	\$8,222	0.3%

Table 6. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total budget	\$3,200,000	\$3,644,072	\$3,663,824	\$3,649,415	\$3,605,086
Incentives	\$1,661,081	\$2,066,680	\$2,046,998	\$1,992,167	\$1,906,407
Administrative Costs	\$1,538,919	\$1,577,392	\$1,616,827	\$1,657,247	\$1,698,679
Incentives as % of budget	52%	57%	56%	55%	53%

Builder incentives are committed to a builder under a contractual agreement that homes under contract will be constructed to GHP standards. This portion of the program cost is not “expensed” on TEP’s general ledger until it is certain that the contract has been satisfied. TEP has determined that satisfaction of the contract occurs when the first home in the subdivision has been inspected and meets program

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requirements. Incentives may not be expensed for a period up to or exceeding two years after the contract has been signed due to the lag-time between land purchase and actual construction. Pre-payments may be made before the dollars are expensed under certain conditions and other accounts may be expensed before payment is made. TEP only reports builder incentives as an actual program cost after they have been expensed. Upon approval of this program TEP is asking for recovery of all builder incentives that have not yet been expensed, but they will not be recovered as a DSM cost until the time they are expensed on the TEP General Ledger.

Estimated Energy Savings

The updated 2007 study by Enovity comparing homes built to GHP standards to IECC 2003 has been used to calculate energy and demand reduction. It has been assumed that the higher builder incentive offered for 14 SEER equipment will apply to 20% of the homes in 2008 and will ramp up during later years. Based on the expected blend of electric/electric and gas/electric homes to be built, the average non-coincident peak reduction for this calculation is 1.4 kW, the average energy reduction during the summer cooling season is 1,370 kWh, the average electric energy reduction during winter heating season is 706 kWh and the average energy reduction for gas during the winter heating season is 12 therms. The 5 year projected capacity and energy benefits are displayed in Table 9.

Table 9. Projected Capacity and Energy Benefits

Annual Incremental Savings	2008	2009	2010	2011	2012
Non-coincident peak (kW)	4,878	6,069	6,012	5,851	5,599
Coincident peak (kW)	3,756	4,673	4,629	4,505	4,311
Energy Savings (kWh)	7,359,684	9,156,756	9,069,549	8,826,614	8,446,640
Energy Savings (Therms)	41,471	51,597	51,106	49,737	47,596

In addition to the savings shown above, it is estimated that the program will produce additional benefits from 2007 – 2012 as shown in Table 10 below:

Table 7. Projected Environmental Benefits, 2008 - 2012

Water Savings	21,429,622	Gallons
SOx	102,434	Lbs
NOx	170,151	Lbs
CO2	89,490,100	Lbs

Additional details on the measure level savings analysis, the benefit cost analysis and the confieration of homes are included in Appendix 4.

Program Cost Effectiveness

The primary data used for this analysis included:

- Tucson Electric Power Company, Guarantee Program Standards, Revisions as of 1/01/2007;
- 2007 Enovity study showing energy and demand reductions for 2007 and beyond; Enovity study is detailed in Appendix 5.

Historic records provide the most accurate representation of the average cost per home for administration and overhead to complete cost benefit analysis for this program. Therefore historical program costs were

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used as a guideline to determine the percentage of total costs to apply in various categories for future program costs.

Additional financial assumptions are provided in Table 11 below.

Table 8. Other Financial Assumptions

Conservation Life (yrs):	18
Program Life (yrs):	5
Demand AC (\$/kW):	\$128.24
Summer Energy AC (\$/kWh):	\$0.07314
Winter Energy AC (\$/kWh):	\$0.05306
Levelized Therms	\$0.94510
Ratio of Non-inc to Incentive Costs	92.6%
IRP Discount Rate:	8.50%
Social Discount Rate	5.00%
NTG Ratio:	95%

Table 12 provides a summary of the estimated benefit – cost ratios, and additional detail behind this analysis. The dollar values in are per home while program rollup benefit cost values can be fund in the TEP DSM Portfolio plan. The societal cost (SC) test uses the social discount rate of 5.0% shown above, but does not include monetized values for other environmental, social or non-energy benefits.

Table 12. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	SC	RIM
PV of Program Benefits	\$2,672	\$3,450	\$2,672
PV of Program Costs	\$1,312	\$1,312	1701.03
Benefit/Cost Ratio	2.04	2.63	1.57

A detailed benefit/cost analysis is presented in Appendix 4.

Appendix 1 – Program Standards



2008 Program Standards

Bullet Points

NOTE: ALL ITEMS REQUIRED BY ENERGY CODES THAT HAVE BEEN ADOPTED IN EACH JURISDICTION MAY NOT SPECIFICALLY BE REFERENCED IN THIS DOCUMENT BUT ARE THE REQUIRED MINIMUM.

1. Contractors

- ❑ General, HVAC, framing, insulation, electric and plumbing work must be completed by licensed contractors in the state of Arizona. License numbers must be provided upon request.

SUBMIT PLANS:

- ❑ Submit complete set of blue-prints to Tucson Electric Power. TEP will complete a room-by-room load calculation to determine if you meet the thermal performance standards and will advise you if modifications are necessary. The load calculation will also be used to determine maximum equipment sizing and to calculate the Guaranteed Heating and Cooling Costs.

Thermal Performance Standards

<u>House Size</u>	<u>Heat Gain (Max.)</u>
Less than 1350 ft ²	15 Btu/Hr/ft ²
Between 1350 and 1850 ft ²	13 Btu/Hr/ft ²
Between 1850 and 2350 ft ²	12 Btu/Hr/ft ²
Greater than 2350 ft ²	11 Btu/Hr/ft ²

- ❑ All windows and sliding glass doors shall be rated by NFRC with a Solar Heat Gain Coefficient equal to or less than 0.40 and a U-value equal to or less than 0.60. French doors are exempt from this requirement.
- ❑ Because the surface location of Low-e coating on tinted glass may cause higher interior glass surface temperatures, Low-e coatings installed on tinted glass will not be allowed in the Guarantee Home Program.

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In the event a home does not meet the thermal performance standards for total heat gain, an alternate method using higher efficiency HVAC equipment may be used to replace the thermal performance requirement.

- ❑ Tubular Skylights (Solar Tube or similar product) are recommended unless the following framing guidelines are used for traditionally framed units. If traditional skylights require are installed, the shaft must be framed to provide a six sided cavity and include a minimum of R13 insulation.. Additional framing requirements may be necessary depending on the application, consult with a TEP technical representative on skylight shaft details.

EQUIPMENT REQUIREMENTS:

- ❑ 13 SEER Electric heat pumps and electric water heaters must be installed to qualify for Rate 201 or the Heating, Cooling and Comfort Guarantee. Gas can be used in these homes for any other use.
- ❑ (OPTIONAL) If 14 SEER Electric heat pumps and electric water heaters are installed the builder will qualify for additional incentives from TEP.
- ❑ Exhaust devices shall be installed to manufacturer's recommendations
- ❑ Recessed lighting must be IC rated (insulation contact) and fit with the appropriate air-tight trim kit.
- ❑ Circulating Pumps installed on any water heater must be equipped with timers or aqua-stats and set to prevent continuous operation.
- ❑ Electric Water Heaters are required to have a minimum .93 EF to meet IECC 2003.

INSPECTIONS AND TESTING:

During the construction process Tucson Electric Power Co. will complete various inspections and testing before the home can qualify for the guarantee and the reduced electric rate. You must notify TEP 2-work days prior to the need for each inspection.

- ❑ Framing Inspection and Duct Test: completed
After intermediate mechanical is
and before insulation is scheduled.
- ❑ Insulation Inspection: is
After lath is installed and insulation
complete.
- ❑ Final inspection, pressure test,
blower-door test, verification of
equipment requirements and operation.
moves in.
After home is complete, HVAC equipment
is started and before homeowner

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FRAMING:

- ❑ Soffits, dropped ceilings, plumbing and utility chases and aesthetical framing details may require capping with an air barrier made of solid, durable materials such as sheetrock, OSB, plywood or thermal-ply. Capping requirements do not apply if the roof deck is used as the ceiling air barrier. Final determination will be made by the TEP Technical representative assigned to the job.
- ❑ Parapet walls must be properly firestopped at either ceiling or roof deck level depending on the location and placement of the ceiling insulation.
- ❑ Roof decks installed over steel framing members such as studs, trusses, C-or I beams, etc. must include a minimum of R-3 insulation to provide a thermal break from outside
- ❑ Exterior window seats or other similar architectural 'pop-out' detail must be sheathed on the outer side of the inner wall to provide a consistent air barrier. An alternative method is to install 1X2 blocking on the outer side of the inner wall every 12" from top to bottom.
- ❑ Mechanical System/Water heater platforms located in the garage must be sheathed on the outer side of the inner wall to provide a consistent air barrier.
- ❑ Drops and soffits used for HVAC duct systems must be designed to provide adequate room for the distribution system without crushing, crimping or restricting designed air flow.
- ❑ Blocking must be installed along the top of trusses in kneewalls that form cathedral ceilings to effectively form a 5-sided box for the installation of insulation. (5 sides includes sheetrock).

The builder is solely responsible for drainage or water intrusion into buildings. It is strongly recommended that a builder consider adding a drainage plane to ICF, concrete forms or other wall non-traditional wall systems

INSULATION:

- ❑ The minimum wall cavity insulation that will be accepted in a 2X4 frame wall is R-13 and the minimum wall cavity insulation that will be accepted in a 2X6 frame wall is R-19.
- ❑ Insulation must be installed to fill the entire cavity. It must be fluffed to full thickness and cut or split to fit around wiring and pipes and installed with no gaps, voids, or compression.
- ❑ Insulation must be in continuous contact and aligned with a solid, durable air barrier such as sheetrock, OSB, plywood, thermal-ply or foam board.
- ❑ If ceiling insulation is installed at the roof-deck, it must be strapped to the deck over areas with dropped ceilings, soffits, and furr down ceiling areas.
- ❑ If loose fill blown-in insulation is used for the ceiling, it is preferable to install a single batt (equivalent R-value to the ceiling insulation) over each top-plate prior to installing blown-in product.

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- ❑ TJI roof systems must include insulation at the necessary R-value to completely fill the space. For instance, R-38 insulation may be required to fill a 12" TJI completely even if R-30 insulation is used as ceiling insulation in truss area.
- ❑ Kneewalls, ponywalls and skylight shafts shall be insulated with the R-value matching the dimensions of the framing material. Insulation in these locations must be installed using one of the following methods.
 - ◆ *Kraft Faced Batts face stapled to the conditioned side of the wall*
 - ◆ *Friction Batts secured in place with straps, netting or cloth*
 - ◆ *Solid, durable material such as OSB, plywood, foamboard or thermal-ply must line the attic side of the area.*
 - ◆ *Blown-in Insulation backed with fabric or netting*
- ❑ Baffles must be installed in each compartment when attic ventilation at eaves is provided by 'bird-boards'. Baffles must be installed in a manner to allow insulation to cover top-plate of wall.
- ❑ Insulation must be installed and secured in place on exterior walls adjacent to kneewalls, ponywalls, dropped ceilings and skylight shafts.
- ❑ Insulated walls or floors between garages and living space shall be sheathed on both sides.

AIR SEALING:

- ❑ All transitions and interfaces from wood to masonry materials must be sealed, gasketed or otherwise made airtight.
- ❑ All electrical and plumbing penetrations between conditioned and unconditioned space shall be sealed using caulk or foam. This includes any penetrations between the garage and living spaces.
- ❑ All window frame gaps shall be sealed using caulk or foam, or a similar gasket material.
- ❑ The bottom sill plate shall be sealed with caulk or a gasket material (sill sealer).
- ❑ If insulation is installed at the roof deck and attic vents are eliminated, all mechanical penetrations through the roof such as fresh air vents, dryer ducts, exhaust fans, etc. must be sealed.

HEATING, VENTILATING, AIR CONDITIONING:

HVAC Load Calculation and Equipment Selection (ALL AREAS EXCEPT MARANA)

Standard: Tucson Electric Power Co. will perform a room by room Manual J based load calculation using the following design information to determine the maximum equipment size.

Indoor temperature for Winter = 72 F

Indoor temperature for Summer = 75° F

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Summer outdoor design temperature = 105° F

Winter outdoor design temperature = 32° F*

Grains of moisture = 0

Wet bulb = 63°

- ❑ Supply air registers installed in the ceiling must be designed and listed as 'ceiling registers' and those installed in a sidewall must be designed and listed as 'wall registers'.
- ❑ Plenum connections to the air handler units must be sealed with mastic. Air handlers located in the attic or garage must have all penetrations such as condensate lines, refrigerant lines or knock-outs sealed.
- ❑ Supply and Return Air Plenum and Trunks at a minimum, must be sized according to 1998 and 2000 International Residential Code (page 303) and/or ACCA Manual D requirements for maximum allowed velocity. (2nd Printing, 1995 – page 3-6) Use the following chart:

RETURN AIR TRUNK CHART

Size AC or Heat Pump	Btuh	IRC (6 sq. inches per 1000 Btuh)	Round Duct Size Minimum	ACCA Manual D (velocity max 700 fpm)
2 ton	24,000	144 sq. inches	13"	14"
2 ½ ton	30,000	180 sq. inches	15"	16"
3 ton	36,000	216 sq. inches	17"	18"
3 ½ ton	42,000	252 sq. inches	18"	19"
4 ton	48,000	288 sq. inches	19"	21"
5 ton	60,000	360 sq. inches	21"	23"

- ❑ Builder will provide an unrestricted surface that allows adequate open area for active return-air design according to ACCA Manual T. Stamped faced grille area will be determined by using $((CFM/300)*.6)$ and bar-type grille area will be determined by using $((CFM/300)*.9)$ if the percentage of open area for each grille type is not known. Use the following chart.

RETURN AIR GRILLE CHART

Size AC or Heat Pump	Nominal CFM	Open Area for RAG ACCA Manual T (cfm/300)	Total Area RAG Stamped Face (60% Open) ACCA Manual T $((cfm/300)*1.4)$	Total Area for RAG Bar Type (90% Open) ACCA Manual T $((cfm/300)*1.1)$
2 ton	800	2.7 sq. ft	3.7 sq. ft.	2.9 sq. ft
2 ½ ton	1000	3.3 sq. ft	4.7 sq. ft.	3.7 sq. ft
3 ton	1200	4.0 sq. ft	5.6 sq. ft.	4.4 sq. ft
3 ½ ton	1400	4.7 sq. ft	6.5 sq. ft.	5.1 sq. ft
4 ton	1600	5.3 sq. ft	7.5 sq. ft.	5.8 sq. ft
5 ton	2000	6.7 sq. ft	9.3 sq. ft.	7.4 sq. ft

Residential New Construction Program

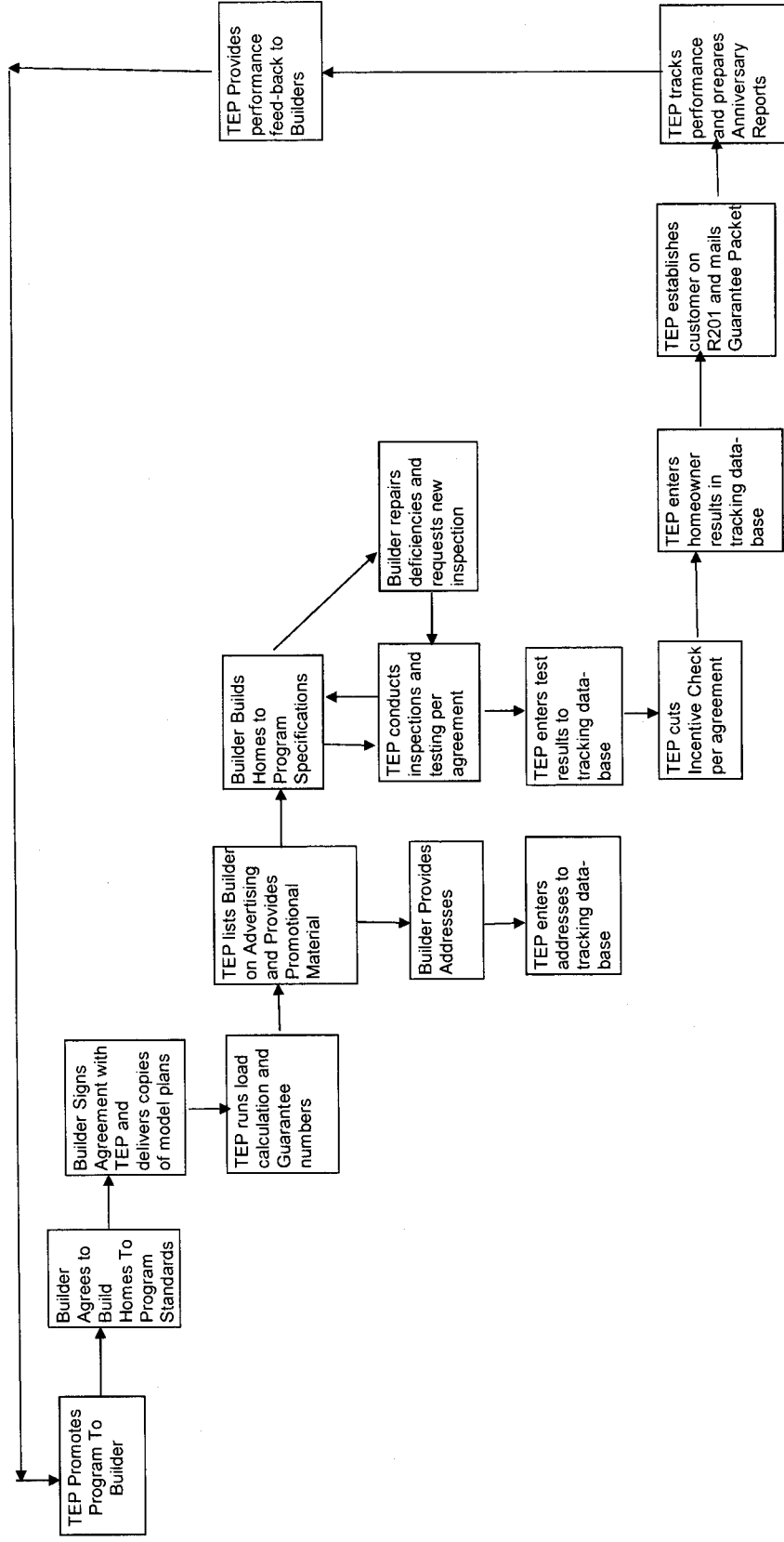
- ❑ All joints in the ductwork must be sealed with mastic or an approved equivalent. Mastic must also be installed on each sheet metal collar to permanently seal the inner core of a flex-duct system to the sheet metal connection.
- ❑ If located in the attic, plenum connections to the air handler units must be sealed with mastic. If located in the garage, plenum connections to the air handler must be sealed with either mastic or butyl-backed tape approved for this application. Air handlers located in the attic or garage must have all penetrations such as condensate lines, refrigerant lines or knockouts sealed.
- ❑ If building cavities such as platforms, framed plenums, stairwells or wall cavities provide the 'path' for an 'active' return, they must be fully ducted returns using either flex-duct or by constructing a manufactured sheet-metal plenum within the building cavity.
- ❑ Total duct leakage measured in CFM at 25 pascals shall be no greater than 3% of conditioned floor area without the air handler in place and no greater than 5% of conditioned floor area including the air handler.
- ❑ Ventilation ducts and equipment must be sealed with mastic at all connections.
- ❑ All bedrooms and offices/dens with a door must be equipped with return air paths from either fully ducted active returns or static returns using jumper ducts or transfer grilles.
- ❑ 'Static' return air paths at a minimum, must be sized with round ducts (or equivalent rectangular) 2" larger than the combined supply duct size (or sizes) required to deliver designed supply CFM to each space. (i.e. Master bedroom and master bath)
- ❑ Opposed blade dampers are required on all supply registers and diffusers. Tested airflow in each room must be within +/- 10% of design.

COMBUSTION SAFETY:

- ❑ Only sealed combustion or power vented equipment is allowed in the living area.
- ❑ Fireplaces and chimneys on exterior walls shall be constructed to maintain continuity of house air and thermal barriers and shall be insulated with a non-combustible material [warm chimneys have a stronger draft and thus are safer to operate].
- ❑ No unvented combustion appliances shall be installed unless specific provision is made for exhaust of combustion products to the outside.
- ❑ TEP will assure that no fireplace zone shall operate with a negative pressure > 3.0 pascals due to envelope standards, HVAC equipment selection or duct design. It is the responsibility of the builder and/or subcontractors to advise occupants of the safe use of exhaust fans installed within the living space if natural-draft fireplaces are installed.

Residential New Construction Program

Appendix 2 – Guaranteed Home Program Implementation Process



Residential New Construction Program

Appendix 3 – Program Costs

Historic Program Costs – 2006

Appendix 3 - Residential New Construction Program - Actual Program Costs - YEAR 2006								
Activity	Planning & Admin	Program Management (Advertising)	Program Implementation	Incentives "Expensed"	Training and Technical	Consumer Education	Total	%
Marketing / Advertising	\$0.00	\$410,228.00	\$0.00	\$0.00	\$0.00	\$8,787.00	\$419,015.00	12%
O & M - Other	\$0.00	\$0.00	\$425,745.00	\$0.00	\$0.00	\$0.00	\$425,745.00	12%
Builder Incentives	\$0.00	\$0.00	\$0.00	\$1,775,284.00	\$0.00	\$0.00	\$1,775,284.00	52%
Inspections/Testing (labor)	\$0.00	\$0.00	\$0.00	\$0.00	\$676,360.00	\$0.00	\$676,360.00	20%
Program Administration (labor)	\$123,603.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$123,603.00	4%
Total	\$123,603.00	\$410,228.00	\$425,745.00	\$1,775,284.00	\$676,360.00	\$8,787.00	\$3,420,007.00	
%	4%	12%	12%	52%	20%	0%		
Description Activities This is an accurate breakdown of 2006 costs.								
Marketing/Advertising - Includes campaign development and placement for print, media and television advertising								
O & M - Other - Includes assoc fees, builder relationship development, printing, mailing, data-base development, Information technology, vehicles, etc.								
Builder Incentives - Actual for year.								
Inspections/Testing - includes FTE conducting inspections, testing, builder training, etc.								
Program Administration-includes labor for Program development planning, reporting, data base design, budget monitoring,etc.								
Budget Allocation								
Planning and Administration - refers to TEP cost to plan and administer programs. Includes management of budgets, oversight of implementation, program development, coordination, customer follow-up, etc.								
Program Management - Includes all expenses related to marketing the program and increasing DSM consumer awareness. (direct program costs)								
Program Implementation - Program delivery costs associated with implementing the program. Includes labor, overhead costs and other direct program delivery costs such as test equipment and load calculations.								
Incentives - Includes the incentives paid directly to builders for participation in the program.								
Training and Technical - Includes all dollars that are used for energy efficiency training, inspections and testing and technical assistance for program participants.								
Consumer Education - Includes all costs for consumer seminars, brochures, web-page, and dollars to support general consumer education.								

Residential New Construction Program

Appendix 4 – Measure Level Energy Savings and Benefit Cost Calculations

Measure Type	DEMAND/ENERGY SAVINGS											
	IECC Base Cooling kWh	IECC Base Heating kWh	IECC Base Peak kW	IECC Base Heating Therms	GH Base Cooling kWh	GH Base Heating kWh	GH Base Peak kW	GH Base Heating Therms	Non-Coincident Demand Savings (KW)	Cooling Energy Savings (KWh)	Heating Energy Savings (KWh)	Heating Energy Savings Therms
Electric Heat and DHE @ 13 SEER	5077	1570	5.9	0	4003	794	4.7	0	1,200	1074	776.00	0
Gas Heat and DHW @ 13 SEER	5077	0	5.7	234	4003	794	4.7	0	1,000	1074	-794.00	234
Electric Heat and DHE @ 14 SEER	5077	1570	5.9	0	3526	780	4.4	0	1,500	1551	790.00	0
Gas Heat and DHW @ 14 SEER	5077	0	5.7	234	3526	780	4.4	0	1,300	1551	-780.00	234
Weighted Average									1,376	1370	706	12

Measure Type	INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS			WGT.	% Incent	TRC	TRC
	IRP PV Benefit (\$)	Social PV Benefit (\$)	Recommended Incentive (\$)	% PV	PV Program Cost (\$)	NPV (\$)	Incr. Cost (\$)	Cost Savings (\$)	Payback w/Inc. (yrs)	Weighting Factor			
Electric Heat and DHE @ 13 SEER	2244	2897	400	18%	1143	1101	812.97	141	5.8	0.36	49%	1.96	2.53
Gas Heat and DHW @ 13 SEER	3176	4100	0	0%	772	2403	812.97	363	2.2	0.02	0%	4.11	5.31
Electric Heat and DHE @ 14 SEER	2859	3690	550	19%	1453	1406	992.67	182	5.5	0.59	55%	1.97	2.54
Gas Heat and DHW @ 14 SEER	3791	4893	0	0%	943	2847	992.67	76	13.1	0.03	0%	4.02	5.19
Weighted Average	\$2,672	\$3,450	469	18%	1312	1360	925	168	5.7	1.00	51%	2.04	2.63

Residential New Construction Program

Appendix 5 – Engineering Simulations

ESS Simulation Report (1999) (Full Report Available Upon Request.)

Table 5
Model Home DOE-2 Annual Simulation Results

Model Home	HVAC			Total Energy		Peak	Total Utility Costs (excluding taxes)			
	Heating (therms)	Cooling (kWh)	Cooling (kWh)	Total (therms)	Total (kWh)	Summer (kW)	Gas: SG-5 (\$)	Electric: TEP 201-B* (\$)	TEP 1** (\$)	Total (\$)
Guarantee Home: Electric Heat & DHW	NA	610	4,853	NA	13,467	4.9	NA	1,011	NA	1,011
Guarantee Home: Gas Heat & DHW	81	37	4,899	270	9,373	4.8	294	NA	899	1,193
Good Cents Home Electric Heat & DHW	NA	929	5,728	NA	14,661	5.7	NA	1,097	NA	1,097
Good Cents Home Gas Heat & DHW	117	50	5,728	306	10,214	5.5	321	NA	976	1,297
Energy Advantage Plus Gas Heat & DHW	156	63	7,426	345	11,925	6.9	350	NA	1,134	1,484
Model Energy Code Gas Heat & DHW	156	63	8,277	345	12,776	7.5	350	NA	1,213	1,563

Footnote:

*TEP 201-B = TOU Rate for all electric Guarantee & Good Cents Homes

**TEP 1 = standard residential rate

Natural gas and electric utility costs include monthly customer charges

Residential New Construction Program

Appendix 5 – Engineering Simulations (Continued)

Enovity Simulation Report (2007) (Full Report Available Upon Request.)



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Residential Home Standards: Energy Analysis & DOE-2 Simulation
Tucson Electric Power Company
February 14th, 2007

after the March 2006 rate case, including fuel adjustment charges estimated from March 2006 to October 2006. Monthly charges and taxes were included in the calculation of the utility costs.

Table 4.0 provides summary results for the residential home DOE-2 model simulations. Included in this table are the annual HVAC heating and cooling consumption (electric and natural gas), the total energy consumption of the home, the summer peak electric demand (kW), and the annual natural gas, electricity and total utility costs. Energy and cost savings are calculated for the Guarantee Home model.

Table 4.1 shows the results of the additional SEER rating simulations for the Guarantee Home (also included was a simulation of the IECC standard with a 10 SEER heat pump).

Table 4.0
Model Home DOE-2 Annual Simulation Results

DOE-2 Model Home	HVAC		Total Energy			Total Utility Costs				
	Heating thermal (MMBtu)	Cooling (MMBtu)	Total thermal (MMBtu)	Total (MMWh)	Summer Peak (kW)	Gas DOGS (\$)	Electric TER R-DOGS (\$)	TER R-DOGS (\$)	TER R-DOGS (\$)	Total (\$)
Guarantee Home Electric Heat & DHW	N/A	784	4,002	N/A	13,334	4.7	N/A	\$1,041	N/A	\$1,041
IECC Standard Electric Heat & DHW	N/A	1,870	5,077	N/A	15,484	5.9	N/A	N/A	\$1,515	\$1,515
Guarantee Home Savings	-	-786	-1,074	-	-1,650	-1.0	-	-	-	\$474
IECC Standard Gas Heat & DHW	234	N/A	5,077	450	10,345	8.7	\$167	N/A	\$1,028	\$1,194
Guarantee Home Savings	-234	-784	-1,018	-450	-1,659	-1.0	\$167	-	-	\$503
Energy Star Homes Electric Heat & DHW	N/A	583	4,140	N/A	13,555	5.0	N/A	N/A	\$1,375	\$1,375
Guarantee Home Savings	-	-199	-727	-	-325	-0.3	-	-	-	\$521
Energy Star Homes Gas Heat & DHW	183	N/A	4,140	348	8,408	4.7	\$541	N/A	\$555	\$1,096
Guarantee Home Savings	-183	-784	-967	-348	-4,008	-0.0	\$541	-	-	\$555

Footnotes:

*Based on 2.1% Gas rate after March 2006 rate case and includes purchased gas adjustment using from data from Mar to Oct 2006

**TER R-DOGS = TDUL Rate for all electric Guarantee Homes

***TER L = standard residential rate

Natural gas and electric utility costs include monthly customer charges and 9.4% tax

Attachment 5

Attachment 5

Residential HVAC Retrofit Program

Residential HVAC Program

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Residential HVAC Program

TEP Residential HVAC Program

Program Concept and Description

This program promotes the installation of high-efficiency air conditioning and heat pump systems in existing homes in TEP's service region. For equipment replacements, the program promotes the selection of high-efficiency equipment that exceeds the federal minimum efficiency standard of 13 SEER. Incentives for the purchase of qualifying high-efficiency equipment are paid directly to homeowners. Any contractor may install or provide qualifying equipment to TEP customers.

TEP will provide consumer education on the benefits of qualifying equipment and will promote the program through TEP promotional events, the TEP website, and print advertising.

Target Market

The program is targeted at all TEP residential customers with central air conditioning who are in the market to replace their existing HVAC equipment.

Current Baseline Conditions

The average lifetime of residential HVAC equipment is approximately 15 years, and it is estimated that most of the equipment that will be replaced under this program will have a rated efficiency of 10 SEER or less. For replacement units the appropriate baseline is the current minimum federal efficiency standard since customers can not purchase equipment with a lower efficiency rating. For all HVAC units manufactured after January 1, 2006 the federal minimum efficiency standard is 13 SEER.

Program Eligibility

The program is available to all TEP residential customers with central air conditioning systems including air conditioner and heat pump systems. All brands of equipment that meet the minimum performance standards are eligible for the program. Homeowners are eligible for the incentive for installing qualifying high-efficiency equipment.

Program Rationale

Air conditioning is a particularly important end use in TEP's desert climate. TEP's residential customers can realize savings on their energy bills through the installation of high-efficiency air conditioning equipment.

Residential HVAC Program

Program Objectives

The objective of the program is to:

- Promote the installation of high-efficiency HVAC equipment that exceeds the minimum 13 SEER federal efficiency standards.

Products and Services

The products and services provided by the program include:

- Incentives to homeowners for the installation of qualifying high-efficiency air conditioners or electric heat pumps. Incentives and qualifying criteria are summarized in Table 1.

Table 1. Incentives Schedule

Measure	Qualifying Criteria	Incentive
High SEER Equipment	14 SEER	\$50/ton
	15 SEER	\$75/ton
	16 SEER	\$100/ton
	17 SEER	\$125/ton
	18 SEER	\$150/ton

- Marketing costs include compensation of \$25 per unit paid to contractors to encourage program promotion and offset costs associated with detailed reporting required on each project.
- Education and promotional efforts designed to inform customers about the benefits of high-efficiency HVAC systems including educational brochures, program promotional material, and TEP website content.

Delivery Strategy and Administration

The strategy to be employed for program delivery and administration is as follows:

- The program will be managed in-house by TEP staff
- TEP will provide overall program management, marketing, planning and coordination of customer and contractor participation tracking and technical support and evaluation.
- Key partnering relationships include:
 - HVAC training professionals;
 - HVAC contractors trained in program procedures; and
 - The Arizona Energy Office to provide training, education and awareness.

Program implementation flow chart is included in Appendix 1.

Residential HVAC Program

Marketing and Communications

The marketing and communications strategy will include the following components:

- TEP will provide program marketing and customer awareness-building through a range of strategies including:
 - Promotions on the TEP website about the benefits of purchasing high-efficiency HVAC equipment;
 - Advertising in major newspapers and other selected print media in the TEP service region to raise awareness of the availability of the program;
 - Providing information through TEP's customer care center;
 - Developing marketing pieces including brochures and other collateral pieces to promote the benefits of qualifying HVAC equipment; and
 - Assistance with responding to customer inquiries about the program, and how to purchase qualifying HVAC equipment.
- The advertising campaign will communicate that high-efficiency HVAC systems will help reduce customer energy bills, provide equal or better comfort conditions, and are beneficial for the environment.

Program Implementation Schedule

Table 2 shows the estimated timeline for key program activities by quarter.

Table 2. Implementation Schedule

Program Activities	2007				2008				2009			
New Program submitted to ACC for approval												
Program approval (estimated)												
Create marketing materials and campaign												
Conduct contractor training												
Conduct program promotions and marketing												
Program implementation and delivery												
Process evaluation												
Measure verification and impact evaluation												
Redesign design program as needed												

Measurement, Evaluation and Research Plan

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the

Residential HVAC Program

implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.

- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Program Budget

The annual budget of approximately \$500,000 will be allocated as shown in Table 3, while Table 4 provides the expected program budgets through 2012. Appendix 2 provides additional details on the 2008 budget.

Table 3. 2008 Program Budget

Total Program Budget	\$500,000
Total Administrative and O&M Cost Allocation	\$65,000
Managerial & Clerical	\$53,300
Travel & Direct Expenses	\$7,800
Overhead	\$3,900
Total Marketing Allocation	\$60,000
Internal Marketing Expense	\$30,000
Subcontracted Marketing Expense	\$30,000
Total Direct Implementation	\$360,000
Financial Incentives	\$259,200
Support Activity Labor	\$68,400
Hardware & Materials	\$18,000
Rebate Processing & Inspection	\$14,400
Total EM&V Cost Allocation	\$15,000
EM&V / Research Activity	\$13,500
EM&V Overhead	\$1,500

Table 4. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total Budget	\$500,000	\$515,000	\$530,450	\$546,364	\$562,754
Incentives	\$259,200	\$266,976	\$274,985	\$283,235	\$291,732
Administrative Costs	\$240,800	\$248,024	\$255,465	\$263,129	\$271,023
Incentives as % of Budget	51.8%	51.8%	51.8%	51.8%	51.8%

Residential HVAC Program

Estimated Energy Savings

Total annual participation goals and demand and energy savings are presented in Table 5. The program expects, on average, 1,158 air conditioning and heat pump systems annually will participate in the program. Appendix 3 provides further information about estimated energy savings for each measure, including the measure and program level benefit cost analysis.

Table 5. Residential Air Conditioning Program Annual Energy Savings

Year	2008	2009	2010	2011	2012
Number of expected participating units	1,090	1,123	1,157	1,191	1,227
Non-coincident peak (kW)	341	351	362	373	384
Coincident peak (kW)	341	351	362	373	384
Energy Savings (kWh)	989,680	1,019,371	1,049,952	1,081,450	1,113,894

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2008 – 2012 presented in Table 6.

Table 6. Projected Environmental Benefits, 2008 - 2012

Water Savings	2,627,173	Gallons
Sox	12,558	Lbs
NOx	20,860	Lbs
CO2	10,971,076	Lbs

Program Cost Effectiveness

The cost effectiveness of each measure and each program as a whole was assessed using the Total Resource Cost (TRC) test, the Societal Cost (SC) test and the Ratepayer Impact Measure (RIM) test. Measure analysis worksheets showing all energy savings, cost and cost-effectiveness calculations are included in Appendix 3.

The cost effectiveness analysis requires estimation of:

- net demand and energy savings attributable to the program;
- net incremental cost to the customer of purchasing qualifying equipment, and of conducting quality installation and test & repair activities;
- TEP's program administration costs;
- the present value of program benefits including TEP avoided costs over the life of the measures; and
- TEP lost revenues.

Table 7 provides a summary of the benefit/cost analysis results for this program. A detailed benefit/cost analysis is presented in Appendix 3.

Residential HVAC Program

Table 7. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	TRC (Societal)	RIM
Benefit/Cost Ratio	1.35	1.68	0.62

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Figure 8.

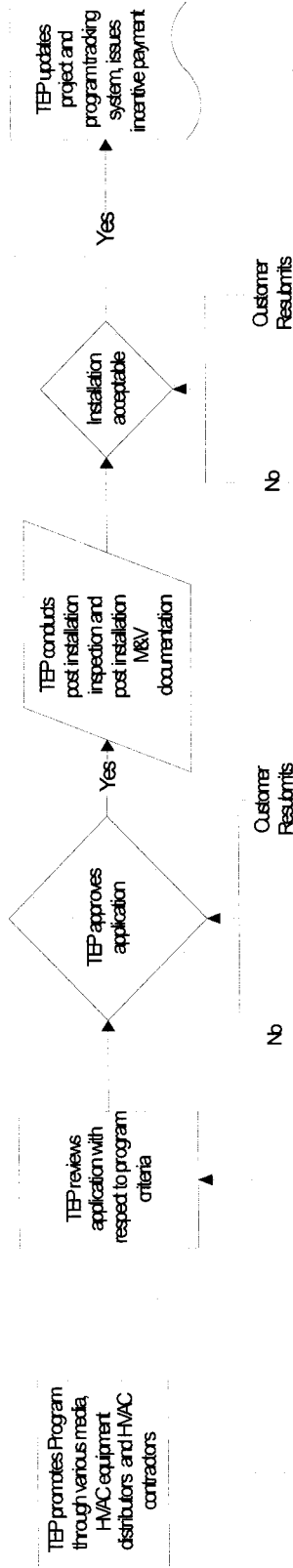
Table 8. Other Financial Assumptions

Conservation Life (yrs):	15
Program Life (yrs):	5
Demand AC (\$/kW):	\$122.42
Summer Energy AC (\$/kWh):	\$0.07218
Winter Energy AC (\$/kWh):	\$0.05209
Ratio of Non-inc to Incentive Costs	83.2%
TRC Discount Rate	8.50%
Social Discount Rate	5.00%
NTG Ratio:	80%

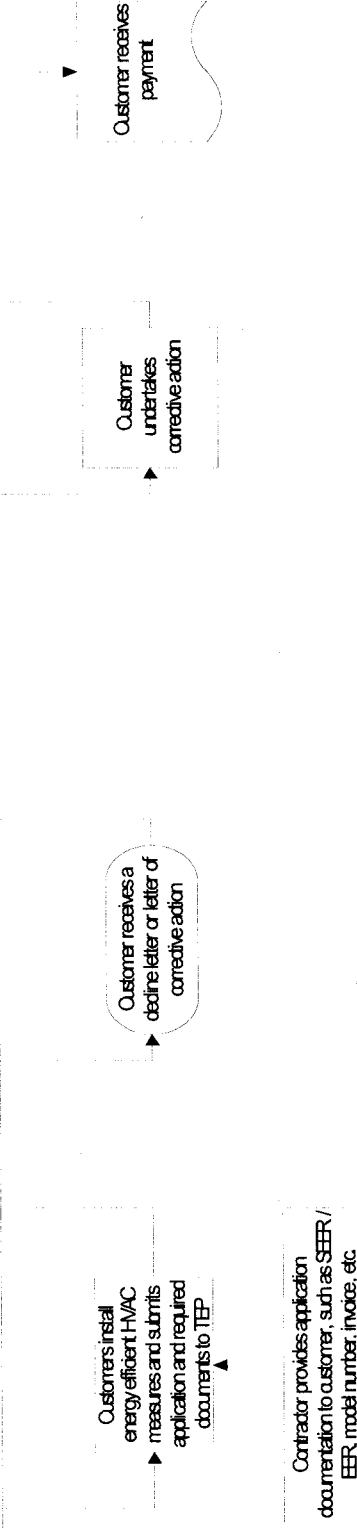
Residential HVAC Program

Appendix 1 – Residential HVAC Retrofit Implementation Plan

TEP Process



Contractor / Customer Process



Residential HVAC Program

Appendix 2 – Program Costs

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$53,300	
Labor - Clerical	\$2,665	5.0%
Labor - Program Design	\$2,665	5.0%
Labor - Program Development	\$2,665	5.0%
Labor - Program Planning	\$7,995	15.0%
Labor - Program/Project Management	\$5,330	10.0%
Labor - Staff Management	\$5,330	10.0%
Labor - Staff Supervision	\$2,665	5.0%
Subcontractor Labor - Clerical	\$2,665	5.0%
Subcontractor Labor - Program Design	\$5,330	10.0%
Subcontractor Labor - Program Development	\$2,665	5.0%
Subcontractor Labor - Program Planning	\$2,665	5.0%
Subcontractor Labor - Program/Project Management	\$10,660	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$53,300</i>	<i>100.0%</i>
Travel & Direct Expenses	\$7,800	
Conference Fees	\$780	10.0%
Labor - Conference Attendance	\$780	10.0%
Subcontractor - Conference Fees	\$156	2.0%
Subcontractor - Travel - Airfare	\$312	4.0%
Subcontractor - Travel - Lodging	\$156	2.0%
Subcontractor - Travel - Meals	\$156	2.0%
Subcontractor - Travel - Mileage	\$156	2.0%
Subcontractor - Travel - Parking	\$156	2.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$702	9.0%
Subcontractor Labor - Conference Attendance	\$156	2.0%
Travel - Airfare	\$1,092	14.0%
Travel - Lodging	\$780	10.0%
Travel - Meals	\$390	5.0%
Travel - Mileage	\$390	5.0%
Travel - Parking	\$234	3.0%
Travel - Per Diem for Misc. Expenses	\$1,404	18.0%
<i>Travel & Direct Expenses</i>	<i>\$7,800</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$3,900	
Equipment - Communications	\$78	2.0%
Equipment - Computing	\$78	2.0%
Equipment - Document Reproduction	\$78	2.0%
Equipment - General Office	\$78	2.0%
Equipment - Transportation	\$78	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$39	1.0%

Residential HVAC Program

Budget Items	Budget	Allocation Rate (%)
Labor - Accounts Receivable	\$39	1.0%
Labor - Administrative	\$39	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$39	1.0%
Labor - Contract Reporting	\$39	1.0%
Labor - Corporate Services	\$39	1.0%
Labor - Facilities Maintenance	\$39	1.0%
Labor - Information Technology	\$39	1.0%
Labor - Materials Management	\$39	1.0%
Labor - Procurement	\$39	1.0%
Labor - Regulatory Reporting	\$1,560	40.0%
Labor - Shop Services	\$39	1.0%
Labor - Telecommunications	\$39	1.0%
Labor - Transportation Services	\$39	1.0%
Office Supplies	\$39	1.0%
Postage	\$39	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$1,365	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%

Residential HVAC Program

Budget Items	Budget	Allocation Rate (%)
<i>Subtotal Overhead</i>	\$3,900	100.0%
Total Administrative Costs	\$65,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$30,000	
Advertisements / Media Promotions	\$7,500	25.0%
Bill Inserts	\$1,200	4.0%
Brochures	\$1,800	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$1,500	5.0%
Labor - Customer Outreach	\$1,500	5.0%
Labor - Customer Relations	\$1,500	5.0%
Labor - Marketing	\$9,000	30.0%
Print Advertisements	\$4,500	15.0%
Radio Spots	\$1,500	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$30,000</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$30,000	
Subcontractor - Bill Inserts	\$1,500	5.0%
Subcontractor - Brochures	\$1,500	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$3,000	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$1,500	5.0%
Subcontractor Labor - Customer Outreach	\$1,500	5.0%
Subcontractor Labor - Customer Relations	\$1,500	5.0%
Subcontractor Labor - Marketing	\$1,500	5.0%
Television Spots	\$0	0.0%
Website Development	\$18,000	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$30,000</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$60,000	
Direct Implementation		
Financial Incentives to Customers	\$259,200	
Activity - Labor	\$68,400	
Labor - Curriculum Development	\$5,472	8.0%
Labor - Customer Education and Training	\$27,360	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$20,520	30.0%
Subcontractor Labor - Facilities Audits	\$6,840	10.0%
Subcontractor Labor - Curriculum Development	\$3,420	5.0%
Subcontractor Labor - Customer Education and Training	\$3,420	5.0%

Residential HVAC Program

Budget Items	Budget	Allocation Rate (%)
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$1,368	2.0%
<i>Subtotal Activity</i>	<i>\$68,400</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$18,000	
Audit Applications and Forms	\$1,440	8.0%
Direct Implementation Literature	\$3,600	20.0%
Education Materials	\$3,600	20.0%
Energy Measurement Tools	\$1,800	10.0%
Installation Hardware	\$1,800	10.0%
Subcontractor - Direct Implementation Literature	\$720	4.0%
Subcontractor - Education Materials	\$720	4.0%
Subcontractor - Energy Measurement Tools	\$2,880	16.0%
Subcontractor - Installation Hardware	\$1,080	6.0%
Subcontractor - Audit Applications and Forms	\$360	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$18,000</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$14,400	
Labor - Field Verification	\$1,440	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$1,440	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$1,440	10.0%
Subcontractor Labor - Field Verification	\$2,880	20.0%
Subcontractor Labor - Rebate Processing	\$4,320	30.0%
Subcontractor Labor - Site Inspections	\$2,880	20.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$14,400</i>	<i>100.0%</i>
Total Direct Implementation	\$360,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$13,500	
Labor - EM&V	\$675	5.0%
Materials - EM&V	\$675	5.0%
Subcontractor Labor - EM&V	\$12,150	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$13,500</i>	<i>100.0%</i>
EM&V Overhead	\$1,500	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$750	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$750	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$1,500</i>	<i>100.0%</i>
Total EM&V	\$15,000	
Total Budget	\$500,000	

See accompanying Excel spreadsheet for 2008-2012 program budgets.

Appendix 3 – Measure Level Energy Savings and Benefit/Cost Analysis

See accompanying Excel spreadsheet for program additional benefit/cost calculations

Global Variables for High Efficiency AC and HP Installations

Conservation Life (yrs):	15
Program Life (yrs):	5
Demand AC (\$/kW):	122.42
Summer On-pk Energy AC (\$/kWh):	0.07218
Summer Off-pk Energy AC (\$/kWh):	0.07218
Winter On-pk Energy AC (\$/kWh):	0.05209
Winter Off-pk Energy AC (\$/kWh):	0.05209
Ratio Non-incent to Incent Cost	92.9%
IRP Discount Rate:	8.50%
Social Discount Rate:	5.00%
NTG Ratio:	80%

High Efficiency AC

AC OPERATING DATA	
On-Pk EFLH:	1105
Off-Pk EFLH:	737
On-Pk Ratio:	60.0%
Off-Pk Ratio:	40.0%
Summer Ratio:	90%
Winter Ratio:	10%
Coincidence Factor***:	1.00
Equipment pk hr load factor:	1.00

Residential HVAC Program

DEMAND/ENERGY SAVINGS											
Unit Type	Unit Size (Tons)	EE SEER	EE EER	Base SEER	Base EER	Demand Savings Per Unit (kW)	On-pk Savings Per Unit (kWh)	Off-pk Savings Per Unit (kWh)			
Packaged and Split	2	14	11.5	13	11.0	0.095	146	97			
Air Conditioners	2.5	14	11.5	13	11.0	0.119	182	121			
14 SEER	3	14	11.5	13	11.0	0.142	219	146			
	3.5	14	11.5	13	11.0	0.166	255	170			
	4	14	11.5	13	11.0	0.190	291	194			
	5	14	11.5	13	11.0	0.237	364	243			
Weighted Average						0.175	270	180			
Packaged and Split	2	15	12.5	13	11.0	0.262	272	181			
Air Conditioners	2.5	15	12.5	13	11.0	0.327	340	227			
15 SEER	3	15	12.5	13	11.0	0.393	408	272			
	3.5	15	12.5	13	11.0	0.458	476	317			
	4	15	12.5	13	11.0	0.524	544	363			
	5	15	12.5	13	11.0	0.655	680	453			
Weighted Average						0.484	503	336			
Packaged and Split	2	16	13.0	13	11.0	0.336	383	255			
Air Conditioners	2.5	16	13.0	13	11.0	0.420	478	319			
16 SEER	3	16	13.0	13	11.0	0.503	574	383			
	3.5	16	13.0	13	11.0	0.587	669	446			
	4	16	13.0	13	11.0	0.671	765	510			
	5	16	13.0	13	11.0	0.839	956	638			
Weighted Average						0.621	708	472			
Packaged and Split	2	17	13.0	13	11.0	0.336	480	320			
Air Conditioners	2.5	17	13.0	13	11.0	0.420	600	400			
17 SEER	3	17	13.0	13	11.0	0.503	720	480			
	3.5	17	13.0	13	11.0	0.587	840	560			
	4	17	13.0	13	11.0	0.671	960	640			

Residential HVAC Program

	5	17	13.0	13	11.0	0.839	1200	800
	Weighted Average					0.621	888	592
Packaged and Split	2	18	13.0	13	11.0	0.336	567	378
Air Conditioners	2.5	18	13.0	13	11.0	0.420	708	472
18 SEER	3	18	13.0	13	11.0	0.503	850	567
	3.5	18	13.0	13	11.0	0.587	992	661
	4	18	13.0	13	11.0	0.671	1134	756
	5	18	13.0	13	11.0	0.839	1417	945
	Weighted Average					0.621	1049	699
Market Weighted Average					0.3127	396	264	

INCENTIVE CALCULATIONS				CUSTOMER COST/SAVINGS				WGT.	% Incent	TRC	Societal
IRP	Social	PV	PV	Incr. Cost	Cost Savings	Payback					
Benefit (\$)	Benefit (\$)	Incentive (Per Unit)	Per Unit (\$)	Per Unit** (\$)	Per Ton (\$)	wo/Inc. w/Inc.	(yrs)	Weighting Factor			
208	261	100	48%	190	19	21	5.8	1.0	0.050	82%	1.3722
261	326	125	48%	237	23	26	5.8	1.0	0.100	82%	1.3722
313	391	150	48%	285	28	31	5.8	1.0	0.150	82%	1.37
365	456	175	48%	332	33	37	5.8	1.0	0.200	82%	1.37
417	521	200	48%	380	37	42	5.8	1.0	0.300	82%	1.37
521	651	250	48%	475	46	52	5.8	1.0	0.200	82%	1.37
386	482	185	0.5	351	34	39	5.8	1.0	1.000	82%	1.37
465	581	150	32%	333	131	39	6.2	2.4	0.050	62%	1.7422
581	726	188	32%	417	164	49	6.2	2.4	0.100	62%	1.7422
697	871	225	32%	500	197	59	6.2	2.4	0.150	62%	1.74
813	1016	263	32%	583	230	68	6.2	2.4	0.200	62%	1.74
929	1161	300	32%	667	263	78	6.2	2.4	0.300	62%	1.74
1162	1452	375	32%	833	328	98	6.2	2.4	0.200	62%	1.74
860	1074	278	0.3	617	243	72	6.2	2.4	1.000	62%	1.74

Residential HVAC Program

624	780	200	32%	477	148	364	55	6.6	3.0	0.050	55%	1.31	1.64
780	976	250	32%	596	185	455	69	6.6	3.0	0.100	55%	1.31	1.64
937	1171	300	32%	715	221	546	82	6.6	3.0	0.150	55%	1.31	1.64
1093	1366	350	32%	834	258	636	96	6.6	3.0	0.200	55%	1.31	1.64
1249	1561	400	32%	954	295	727	110	6.6	3.0	0.300	55%	1.31	1.64
1561	1951	500	32%	1192	369	909	137	6.6	3.0	0.200	55%	1.31	1.64
1155	1444	370	0.3	882	273	673	102	6.6	3.0	1.000	55%	1.31	1.64
707	884	250	35%	620	87	485	69	7.0	3.4	0.050	52%	1.14	1.43
884	1105	313	35%	775	109	606	86	7.0	3.4	0.100	52%	1.14	1.43
1061	1326	375	35%	930	131	727	103	7.0	3.4	0.150	52%	1.14	1.43
1238	1547	438	35%	1085	153	849	121	7.0	3.4	0.200	52%	1.14	1.43
1415	1768	500	35%	1240	174	970	138	7.0	3.4	0.300	52%	1.14	1.43
1768	2210	625	35%	1550	218	1212	172	7.0	3.4	0.200	52%	1.14	1.43
1309	1636	463	0.4	1147	161	897	128	7.0	3.4	1.000	52%	1.14	1.43
781	976	300	38%	764	17	606	81	7.4	3.8	0.050	49%	1.02	1.28
976	1220	375	38%	955	22	758	102	7.4	3.8	0.100	49%	1.02	1.28
1172	1464	450	38%	1145	26	909	122	7.4	3.8	0.150	49%	1.02	1.28
1367	1709	525	38%	1336	31	1061	142	7.4	3.8	0.200	49%	1.02	1.28
1562	1953	600	38%	1527	35	1212	163	7.4	3.8	0.300	49%	1.02	1.28
1953	2441	750	38%	1909	44	1515	203	7.4	3.8	0.200	49%	1.02	1.28
1445	1806	555	0.384	1413	32	1121	151	7.449	3.763	1.000	49%	1.02	1.28
615	769	238	0.419	503	113	352	57	6.030	1.646	1.000	68%	1.22410	1.53

Residential HVAC Program

High Efficiency Heat Pumps

HP OPERATING DATA	
On-Pk EFLH Cooling:	1105
Off-Pk EFLH Cooling:	737
On-pk Ratio:	60.0%
Off-pk Ratio:	40.0%
Summer Ratio:	90%
Winter Ratio:	10%
Coincidence Factor***:	1.00
Equipment pk hr load factor:	1.00
On-Pk EFLH Heating:	504
Off-Pk EFLH Heating:	757

DEMAND/ENERGY SAVINGS													
Unit	Unit	EE	EE	Base	Base	EE	Base	Base	EE	Base	Base	Demand	On-pk
Type	Size	SEER	EER	SEER	EER	SEER	EER	HSPF	HSPF	HSPF	Per Unit	Savings	Per Unit
(Tons)	(Tons)										(KWh)	(KWh)	(KWh)
Packaged and Split	2	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.095	200	179
Heat Pumps	2.5	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.119	251	224
14 SEER	3	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.142	301	269
	3.5	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.166	351	314
	4	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.190	401	358
	5	14	11.5	13	11.0	8.30	8.00	8.00	8.00	8.00	0.237	501	448
Weighted Average												0.175	332
Packaged and Split	2	15	12.5	13	11.0	8.70	8.00	8.00	8.00	8.00	0.262	394	364
Heat Pumps	2.5	15	12.5	13	11.0	8.70	8.00	8.00	8.00	8.00	0.327	492	455
15 SEER	3	15	12.5	13	11.0	8.70	8.00	8.00	8.00	8.00	0.393	591	546
	3.5	15	12.5	13	11.0	8.70	8.00	8.00	8.00	8.00	0.458	689	637
	4	15	12.5	13	11.0	8.70	8.00	8.00	8.00	8.00	0.524	788	728

Residential HVAC Program

	5	15	12.5	13	11.0	8.70	8.00	0.655	985	910
Weighted Average								0.484	729	673
Packaged and Split	2	16	13.0	13	11.0	9.00	8.00	0.336	551	507
Heat Pumps	2.5	16	13.0	13	11.0	9.00	8.00	0.420	688	634
16 SEER	3	16	13.0	13	11.0	9.00	8.00	0.503	826	761
	3.5	16	13.0	13	11.0	9.00	8.00	0.587	964	888
	4	16	13.0	13	11.0	9.00	8.00	0.671	1101	1014
	5	16	13.0	13	11.0	9.00	8.00	0.839	1377	1268
Weighted Average								0.621	1019	938
Packaged and Split	2	17	13.0	13	11.0	9.30	8.00	0.336	692	637
Heat Pumps	2.5	17	13.0	13	11.0	9.30	8.00	0.420	865	797
17 SEER	3	17	13.0	13	11.0	9.30	8.00	0.503	1037	956
	3.5	17	13.0	13	11.0	9.30	8.00	0.587	1210	1115
	4	17	13.0	13	11.0	9.30	8.00	0.671	1383	1275
	5	17	13.0	13	11.0	9.30	8.00	0.839	1729	1593
Weighted Average								0.621	1279	1179
Packaged and Split	2	18	13.0	13	11.0	9.70	8.00	0.336	832	776
Heat Pumps	2.5	18	13.0	13	11.0	9.70	8.00	0.420	1040	970
18 SEER	3	18	13.0	13	11.0	9.70	8.00	0.503	1248	1163
	3.5	18	13.0	13	11.0	9.70	8.00	0.587	1456	1357
	4	18	13.0	13	11.0	9.70	8.00	0.671	1664	1551
	5	18	13.0	13	11.0	9.70	8.00	0.839	2080	1939
Weighted Average								0.621	1539	1435
Market Weighted Average								0.313	561	512

INCENTIVE CALCULATIONS				CUSTOMER COST/SAVINGS				WGT.		TRC	Societal
IRP	Social	PV	PV	Incr.	Cost	Cost	Savings	Payback	Weighting		
Benefit	Benefit	Recommended	Cost	Per Unit**	Per Unit	wo/Inc.	w/Inc.		Factor	%	Incent
(\$)	(\$)	(\$)	% PV	(\$)	(\$)	(yrs)	(yrs)				

Residential HVAC Program

278	348	100	36%	278	0	231	32	7.1	4.1	0.050	43%	1.00	1.25
348	435	125	36%	320	28	255	40	6.3	3.2	0.100	49%	1.09	1.36
417	522	150	36%	351	66	264	49	5.4	2.4	0.150	57%	1.19	1.49
487	609	175	36%	390	97	284	57	5.0	1.9	0.200	62%	1.25	1.56
557	696	200	36%	424	133	298	65	4.6	1.5	0.300	67%	1.31	1.64
696	870	250	36%	497	199	331	81	4.1	1.0	0.200	76%	1.40	1.75
515	643	185	36%	403.1	112	289	60	5.0	1.9	1.000	64%	1.28	1.59621
620	775	150	24%	509	111	462	65	7.2	4.8	0.050	32%	1.22	1.52
775	969	188	24%	582	193	509	81	6.3	4.0	0.100	37%	1.33	1.67
930	1162	225	24%	632	298	529	97	5.5	3.1	0.150	43%	1.47	1.84
1085	1356	263	24%	699	386	569	113	5.0	2.7	0.200	46%	1.55	1.94
1240	1550	300	24%	755	485	595	129	4.6	2.3	0.300	50%	1.64	2.05
1550	1937	375	24%	878	672	662	161	4.1	1.8	0.200	57%	1.77	2.21
1147	1434	278	24%	720	427	578	119	5.0	2.7	1.000	48%	1.59	1.99035
839	1049	200	24%	741	98	694	90	7.7	5.5	0.050	29%	1.13	1.42
1049	1311	250	24%	844	205	764	113	6.8	4.6	0.100	33%	1.24	1.55
1258	1573	300	24%	913	345	793	135	5.9	3.6	0.150	38%	1.38	1.72
1468	1835	350	24%	1008	460	853	158	5.4	3.2	0.200	41%	1.46	1.82
1678	2097	400	24%	1086	592	893	180	5.0	2.7	0.300	45%	1.55	1.93
2097	2622	500	24%	1259	839	992	225	4.4	2.2	0.200	50%	1.67	2.08
1552	1940	370	0.2	1037	515	867	167	5.4	3.2	1.000	43%	1.50	1.86993
977	1222	250	26%	972	5	925	113	8.2	6.0	0.050	27%	1.01	1.26
1222	1527	313	26%	1105	116	1019	142	7.2	5.0	0.100	31%	1.11	1.38
1466	1832	375	26%	1195	271	1058	170	6.2	4.0	0.150	35%	1.23	1.53
1710	2138	438	26%	1317	393	1138	198	5.7	3.5	0.200	38%	1.30	1.62
1955	2443	500	26%	1417	538	1191	226	5.3	3.0	0.300	42%	1.38	1.72
2443	3054	625	26%	1639	804	1323	283	4.7	2.5	0.200	47%	1.49	1.86
1808	2260	463	0.3	1355	453	1156	209	5.7	3.5	1.000	40%	1.33	1.66823
1120	1399	300	27%	1204	-84	1156	137	8.4	6.3	0.050	26%	0.93	1.16
1399	1749	375	27%	1367	32	1273	171	7.4	5.3	0.100	29%	1.02	1.28
1679	2099	450	27%	1476	203	1322	205	6.4	4.2	0.150	34%	1.14	1.42
1959	2449	525	27%	1626	334	1422	240	5.9	3.7	0.200	37%	1.21	1.51
2239	2799	600	27%	1748	491	1488	274	5.4	3.2	0.300	40%	1.28	1.60

Residential HVAC Program

2799	3498	750	27%	2020	779	1654	342	4.8	2.6	0.200	45%	1.39	1.73
2071	2589	555	0.3	1672	399	1445	253	5.9	3.7	1.000	38%	1.238858	1.548478
826	1033	238	0	584	242	454	91	5.07	2.30	1.000	52%	1.42	1.77

Attachment 6

Shade Tree Program

Attachment 6

Shade Tree Program

Shade Tree Program

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Shade Tree Program

TEP Shade Tree Program

Program Concept and Description

The purpose of the Shade Tree Program is to promote energy conservation and the environmental benefits associated with planting low-water usage trees. TEP provides desert-adapted trees to residential neighborhoods, low-income families, public areas and schools.

TEP has partnered with Trees for Tucson since 1992 and is proposing to increase annual funding from \$78,000 to \$160,000 and continue the successful and very popular Shade Tree Program in the future. The Trees for Tucson program is administered through Tucson Clean and Beautiful, a non-profit environmental organization. TEP is committed to continuing positive community service as well as delivering programs that provide societal and environmental benefits.

Since 1992 Trees for Tucson has distributed approximately 50,000 trees for residential shade tree planting in TEP's service territory using DSM funding from TEP. Trees for Tucson also provides an educational program giving presentations to schools and holding educational workshops every year. In addition to the residential Shade Tree Program, Trees for Tucson also has a community and school tree planting program.

Requirements of the residential Shade Tree Program include locating trees on the south, west and east sides of homes and within 15 feet of the homes. These requirements are necessary to provide direct shading to the buildings. All trees must be planted in the TEP service area.

The community and the school contributions from the TEP Shade Tree Program may not necessarily provide direct shading to the building but it does provide trees to neighborhood streets and school yards and other public areas. Even without energy and demand contributions from these installations, trees provide carbon sequestration and other benefits as outlined below in the Program Rationale.

Target Market

The program has a few primary markets:

- Residential Program – Allows TEP customers to purchase two trees for only \$6.00 each, if they agree to plant them to shade their homes to reduce energy use.
- Schools Program – In addition to planting trees at schools, Trees for Tucson also offers education to classroom. (See the Marketing and Communications Section below.)
- Community Programs – Trees for Tucson has provided trees for non-profit community housing projects and roadways.

Current Baseline Conditions

In the absence of the current TEP Shade Tree Program, in general, existing homeowners and non-residential building operators do not understand the energy benefits of planting trees. Most customers will plant a tree solely for aesthetic purposes.

Shade Tree Program

Program Rationale

In addition to the kW and kWh savings received from homes, there is significant benefit in the CO₂ sequestration.

Some other environmental benefits from a Shade Tree Program include:

- (1) Provide habitat for wildlife;
- (2) Absorb air and water pollutants;
- (3) Control stormwater runoff; and
- (4) Control soil erosion and wind.

Planting trees conserves energy in a variety of ways:

- (1) Shading reduces the amount of radiant energy absorbed and stored by built surfaces including surrounding hardscapes such as walls, pavement and gravel yards.
 - (2) Evapotranspiration, converts liquid water in leaves to vapor, thereby cooling the air.
 - (3) By reducing the velocity of wind, which slows the infiltration of outside air into inside spaces.
-

Program Objectives

The primary program objective is to plant trees to provide energy and demand savings through the above-mentioned conservation methods. A secondary objective is to educate school-age children and the public on the conservation and environmental benefits of planting trees. Other benefits include the many positive environmental effects outlined in the Program Rationale.

Products and Services Provided

TEP will provide DSM funds for the planting of trees within the guidelines that provide kWh savings. In addition, funds are, and will continue to be used for the Community and the Schools tree planting projects. TEP's funds are leveraged with a significant in-kind contribution of labor, material and technical support from individuals and the Tucson community to make this program a success.

Residential – Up to two, five-gallon trees per residence are allowed under the TEP Shade Tree Program (*Within 15ft of the building and on the west, south or east sides of the building*). Detailed planting and maintenance information is provided to each recipient when trees are delivered to aid with the trees' survival. Tree maintenance articles are placed in neighborhood newsletters informing residents of watering needs during the critical summer months.

Schools and Community – One or more five-gallon or fifteen-gallon sized trees can be planted on school grounds or in community housing projects and along neighborhood streets and at non-profit facilities for beautification and shading.

Shade Tree Program

Education – Trees for Tucson provides educational opportunities for schools and the public. They offer presentations on trees and tree planting for elementary and secondary school classrooms, as well as trees tours of Tucson.

All varieties of Mesquite qualify for the program as well as other desert adapted, low water usage trees. Selection of trees is based on demand and availability. An example of trees allowed in the program are:

- Chilean Mesquite*;
- Ironwood;
- Sweet Acacia;
- Velvet Mesquite;
- Blue Palo Verde*;
- Desert Willow*;
- Palo Brea

* Most popular

Delivery Strategy and Administration

This program is managed and administered through Trees for Tucson a Tucson Clean and Beautiful program. The program implementation plan is included in Appendix 2.

Residential – TEP residential customers are required to fill out a Trees for Tucson application in the brochure or on-line at www.tressfortucson.com. (See Appendix 1 - Trees for Tucson Brochure.) Tree choices listed on the application will vary depending on tree availability from plant nurseries throughout the year. The most common trees used are Mesquite, Blue Palo Verde, and Willow Acacia. Trees are delivered to the home of the applicant within a few weeks of receipt of the application by Trees for Tucson.

School and Community Projects – Trees for Tucson coordinates with school and community groups that have a need for trees. This generally involves meeting on site and offering recommendations on appropriate trees and, in some cases, helping coordinate the actual planting with students and other volunteers (i.e., Eagle Scout groups, neighborhood residents, community service organization, etc.).

Tracking - During previous years TEP relied on Trees for Tucson to monitor activity, track the number and type of trees planted, etc. For the proposed DSM program in order to monitor and evaluate the energy and demand savings associated with the Shade Tree Program TEP will track tree installations with type of tree and the physical location of the trees at each address. This will require TEP to develop a tracking form and data base and it will require Trees for Tucson to complete data entry for each customer.

Marketing and Communications

Due to the popularity of the program, DSM revenues are not normally allocated for advertising and promotion. Tucson Clean and Beautiful was directed by TEP to focus its efforts on fulfilling orders for those customers on a waiting list to receive trees. In 2006 TEP did assist financially in the production of new brochures, a tradeshow booth, and premium items as requested – the approximate costs were \$9,700 but this is not expected to be an annual expense.

Shade Tree Program

TEP employees currently inform customers about the program during speaking engagements and outreach presentations. TEP also provides a link from its Web site to the Tucson Clean and Beautiful Web site.

The primary effort for marketing and education is provided by Trees for Tucson. These activities include:

General Brochure – Trees for Tucson, with the help of TEP has updated its brochure which gives general benefits of tree planting, educational opportunities, and an application. (See Appendix 1 - Trees for Tucson Brochure);

Residential – Trees for Tucson leaves behind an educational information sheet on the planting and on-going care for the trees;

Schools –Presentations are made on trees for elementary and secondary school classrooms in an effort to increase awareness of the importance of trees to the environment;

Tree Tours –Such tours, which include an annual “Great Trees of the Old Pueblo” are conducted twice a year in and around Tucson; and.

Tree Care Workshops – Workshops are held throughout the year and are free to public, cover tree selection, planting, pruning and irrigation, as proper tree care is crucial to the survival of newly planted trees.

Program Implementation Schedule

TEP plans to continue existing funding to the Shade Tree Program until additional funding is approved through this filing. Figure 1 provides the implementation schedule for the 2008 – 2012 program cycle.

Table 1. Implementation Schedule

Program Activities	2007				2008				2009			
Continue ongoing Shade Tree Program												
New program pre-approval submit												
New program approval (estimated)												
Implementation of new program (kick-off)												
Process evaluation												
Savings verification												
Program redesign as needed												

Monitoring and Evaluation Plan

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

Shade Tree Program

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Program Costs

The TEP Shade Tree Program budget consists of several categories:

Direct implementation – This direct implementation cost includes the cost of the tree, the delivery truck, and the labor associated with direct implementation. This is 83% of the total budget.

Administration - Trees for Tucson – This category consists of application processing and documentation for program measurement and evaluation.

Administration - TEP – This category consists of budget monitoring, reporting, and program measurement and evaluation.

Table 2. Program Costs

Program Costs		
ADMINISTRATION – TEP (including M&V)	Labor	\$20,000
ADMINISTRATION – Trees for Tucson	Labor	\$6,667
Cost and delivery of the Trees to Customers	Delivery	\$133,333
Total Residential, School, and Community Projects		\$160,000

The annual budget of approximately \$160,000 will be allocated as shown in Table 2, while Table 3 provides the expected program budgets through 2012. Appendix 3 provides an estimate of details on the 2008 budget. The budget for the program will not be adjusted for inflation during this period, and will remain fixed.

Shade Tree Program

Table 3. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total Budget	\$160,000	\$160,000	\$160,000	\$160,000	\$160,000
Incentives	\$133,333	\$133,333	\$133,333	\$133,333	\$133,333
Administrative Costs	\$26,667	\$26,667	\$26,667	\$26,667	\$26,667
Incentives as % of Budget	83.33%	83.33%	83.33%	83.33%	83.33%

Estimated Energy Savings

Estimated savings were derived from a variety of secondary research and various assumptions were made based on a review of similar programs being operated by various utilities with similar climate characteristics. The primary source of information was taken from a report compiled by Gregory McPherson and James R. Simpson, Desert Southwest Community Tree Guide – Benefits, Costs and Strategic Planting by, 2004. (See Appendix A of the Desert Southwest Community Tree Guide)

Total annual demand and energy savings goals are presented in Table 4. Because the energy benefits derived from planting trees require years to derive, these annual savings are based on the expected average annual savings to be achieved over 20 years, allowing for 30% attrition for the population of trees planted each year. It is expected that the program will fund the planting of approximately 5,800 trees annually in the 2008 – 2012 program.

The past history of the program is considered to be a good proxy for future energy efficiency yields from trees being planted in the 2008 – 2012 program because the quantity and mix of trees being planted, and the markets being served, remained relatively consistent as the program matured. Past history also indicates that the tree mix is approximately 60% Mesquite variety, 10% Willow Acacia, 20% Conifers, and 10% from various other qualified species.

Table 4. Representative Annual Shade Trees Program Energy Savings

Year	2008	2009	2010	2011	2012
Non-coincident peak (kW)	0	0	0	0	0
Coincident peak (kW)	0	0	0	0	0
Energy Savings (kWh)	219,884	233,627	247,369	261,112	274,855

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2008 – 2012 presented in Table 5, again based on historic program activity.

Table 5. Projected Environmental Benefits, 2008 – 2012, based on Historic Program Performance

Water Savings	618,423	Gallons
SOx	2,956	Lbs
NOx	4,910	Lbs
CO2	2,582,536	Lbs

Shade Tree Program

Program Cost Effectiveness

Table 6 provides a summary of the benefit/cost analysis results for this program. As discussed previously, these values represent an analysis of past program activity and represent the average annual cost-benefit performance of the program at current avoided costs. A detailed benefit/cost analysis is presented in Appendix 4. A conservation life of 20 years was selected to provide the current avoided capacity and energy costs values for program activity in 1993.

Table 6. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	SC	RIM
Benefit/Cost Ratio	2.28	3.01	0.98

Additional financial assumptions are provided in Table 7.

Table 7. Other Financial Assumptions

Conservation Life (yrs):	20
Program Life (yrs):	5
Demand AC (\$/kW):	\$128.24
Summer Energy AC (\$/kWh):	\$0.07314
Winter Energy AC (\$/kWh):	\$0.06310
Ratio of Non-inc to Incentive Costs	20.0%
IRP Discount Rate:	8.50%
Social Discount Rate	5.00%
NTG Ratio:	95%

Shade Tree Program

Appendix 1 – Trees for Tucson Brochure

Thanks to your participation in the Shade Tree Program, your neighborhood will be a more beautiful place to live. To get trees added to the program, you must first be a TUCSON - ATTACHED HOMEOWNER. Attached means you own the house and the land on which it sits. If you own the house but not the land, you must also own the land on which the house sits. If you own the house and the land but not the trees, you must also own the trees.

To qualify, you must provide:

- A valid Tucson City Council District (CD) number. (See the map on the back of this brochure for CD numbers.)
- Each tree must be at least 10 years old.
- Each tree must be at least 10 inches in diameter at breast height (DBH).
- Each tree must be at least 10 feet tall.

Each tree must be at least 10 years old. If you are unsure of the age of a tree, you can have a professional arborist or a trained volunteer measure it for you.

If the tree is less than 10 years old, you must provide a letter from a professional arborist or a trained volunteer stating the tree's age.

If the tree is less than 10 inches in diameter at breast height, you must provide a letter from a professional arborist or a trained volunteer stating the tree's diameter.

If the tree is less than 10 feet tall, you must provide a letter from a professional arborist or a trained volunteer stating the tree's height.

If the tree is less than 10 years old, you must provide a letter from a professional arborist or a trained volunteer stating the tree's age.

If the tree is less than 10 inches in diameter at breast height, you must provide a letter from a professional arborist or a trained volunteer stating the tree's diameter.

If the tree is less than 10 feet tall, you must provide a letter from a professional arborist or a trained volunteer stating the tree's height.

If the tree is less than 10 years old, you must provide a letter from a professional arborist or a trained volunteer stating the tree's age.

If the tree is less than 10 inches in diameter at breast height, you must provide a letter from a professional arborist or a trained volunteer stating the tree's diameter.

If the tree is less than 10 feet tall, you must provide a letter from a professional arborist or a trained volunteer stating the tree's height.

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If the tree is less than 10 inches in diameter at breast height, you must provide a letter from a professional arborist or a trained volunteer stating the tree's diameter.

If the tree is less than 10 feet tall, you must provide a letter from a professional arborist or a trained volunteer stating the tree's height.

If the tree is less than 10 years old, you must provide a letter from a professional arborist or a trained volunteer stating the tree's age.

If the tree is less than 10 inches in diameter at breast height, you must provide a letter from a professional arborist or a trained volunteer stating the tree's diameter.

If the tree is less than 10 feet tall, you must provide a letter from a professional arborist or a trained volunteer stating the tree's height.

If the tree is less than 10 years old, you must provide a letter from a professional arborist or a trained volunteer stating the tree's age.

YOU MUST COMPLETE THIS SKETCH TO QUALIFY:

Number and Mark with an X where you will place trees in the following areas:



Notes: Plant trees at a minimum 10 ft. from power lines, 1 ft. from water lines, and 3 ft. from all other utilities. Do not plant under any overhead lines. Do not plant in public right-of-way, without a permit and Blue Sticks clearance (Tucson, AZ 85714).

Mail signed application with photos to: TREES FOR TUCSON, P.O. Box 27310, Tucson, AZ 85726-0310.

Name (print)

Address

City

State

Zip

Phone

E-mail

Signature

Date

CD Number

DBH

Height

Age

Notes

Comments

Other

Total

Total

Total

Total

Total

Total

Total

Total

Total

Total

Total

Total

Total

Total

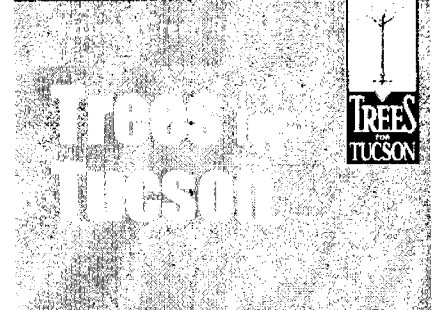
Total

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Total

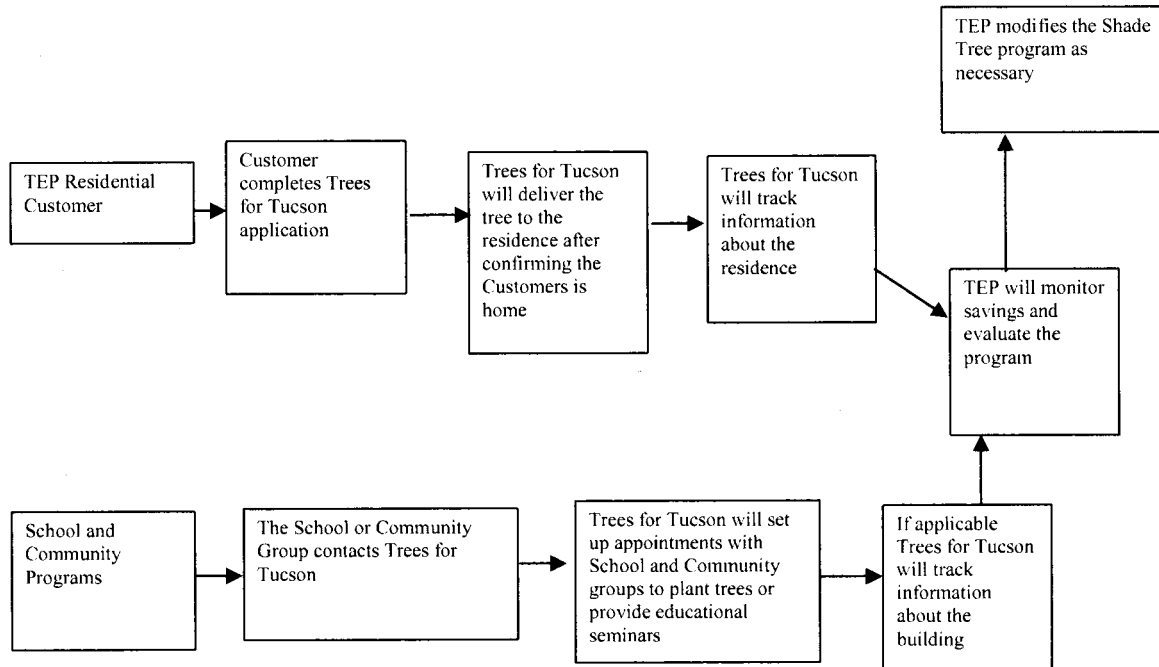
Total

Total



Shade Tree Program

Appendix 2 – Shade Tree Program Implementation Process



Shade Tree Program

Appendix 3 – Program Costs

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$9,600	
Labor - Clerical	\$480	5.0%
Labor - Program Design	\$480	5.0%
Labor - Program Development	\$480	5.0%
Labor - Program Planning	\$1,440	15.0%
Labor - Program/Project Management	\$960	10.0%
Labor - Staff Management	\$960	10.0%
Labor - Staff Supervision	\$480	5.0%
Subcontractor Labor - Clerical	\$480	5.0%
Subcontractor Labor - Program Design	\$960	10.0%
Subcontractor Labor - Program Development	\$480	5.0%
Subcontractor Labor - Program Planning	\$480	5.0%
Subcontractor Labor - Program/Project Management	\$1,920	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$9,600</i>	<i>100.0%</i>
Travel & Direct Expenses	\$0	
Conference Fees	\$0	0.0%
Labor - Conference Attendance	\$0	0.0%
Subcontractor - Conference Fees	\$0	0.0%
Subcontractor - Travel - Airfare	\$0	0.0%
Subcontractor - Travel - Lodging	\$0	0.0%
Subcontractor - Travel - Meals	\$0	0.0%
Subcontractor - Travel - Mileage	\$0	0.0%
Subcontractor - Travel - Parking	\$0	0.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$0	0.0%
Subcontractor Labor - Conference Attendance	\$0	0.0%
Travel - Airfare	\$0	0.0%
Travel - Lodging	\$0	0.0%
Travel - Meals	\$0	0.0%
Travel - Mileage	\$0	0.0%
Travel - Parking	\$0	0.0%
Travel - Per Diem for Misc. Expenses	\$0	0.0%
<i>Travel & Direct Expenses</i>	<i>\$0</i>	<i>0.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$6,400	
Equipment - Communications	\$128	2.0%
Equipment - Computing	\$128	2.0%
Equipment - Document Reproduction	\$128	2.0%
Equipment - General Office	\$128	2.0%

Shade Tree Program

Budget Items	Budget	Allocation Rate (%)
Equipment - Transportation	\$128	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$64	1.0%
Labor - Accounts Receivable	\$64	1.0%
Labor - Administrative	\$64	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$64	1.0%
Labor - Contract Reporting	\$64	1.0%
Labor - Corporate Services	\$64	1.0%
Labor - Facilities Maintenance	\$64	1.0%
Labor - Information Technology	\$64	1.0%
Labor - Materials Management	\$64	1.0%
Labor - Procurement	\$64	1.0%
Labor - Regulatory Reporting	\$2,560	40.0%
Labor - Shop Services	\$64	1.0%
Labor - Telecommunications	\$64	1.0%
Labor - Transportation Services	\$64	1.0%
Office Supplies	\$64	1.0%
Postage	\$64	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%

Shade Tree Program

Budget Items	Budget	Allocation Rate (%)
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$2,240	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$6,400</i>	<i>100.0%</i>
Total Administrative Costs	\$16,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$0	
Advertisements / Media Promotions	\$0	25.0%
Bill Inserts	\$0	4.0%
Brochures	\$0	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$0	5.0%
Labor - Customer Outreach	\$0	5.0%
Labor - Customer Relations	\$0	5.0%
Labor - Marketing	\$0	30.0%
Print Advertisements	\$0	15.0%
Radio Spots	\$0	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$0</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$0	
Subcontractor - Bill Inserts	\$0	5.0%
Subcontractor - Brochures	\$0	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$0	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$0	5.0%
Subcontractor Labor - Customer Outreach	\$0	5.0%
Subcontractor Labor - Customer Relations	\$0	5.0%
Subcontractor Labor - Marketing	\$0	5.0%
Television Spots	\$0	0.0%
Website Development	\$0	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$0</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$0	
Direct Implementation		
Financial Incentives to Customers	\$133,333	
Activity - Labor	\$6,667	

Shade Tree Program

Budget Items	Budget	Allocation Rate (%)
Labor - Curriculum Development	\$533	8.0%
Labor - Customer Education and Training	\$2,667	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$2,000	30.0%
Subcontractor Labor - Facilities Audits	\$667	10.0%
Subcontractor Labor - Curriculum Development	\$333	5.0%
Subcontractor Labor - Customer Education and Training	\$333	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$133	2.0%
<i>Subtotal Activity</i>	<i>\$6,667</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$0	
Audit Applications and Forms	\$0	8.0%
Direct Implementation Literature	\$0	20.0%
Education Materials	\$0	20.0%
Energy Measurement Tools	\$0	10.0%
Installation Hardware	\$0	10.0%
Subcontractor - Direct Implementation Literature	\$0	4.0%
Subcontractor - Education Materials	\$0	4.0%
Subcontractor - Energy Measurement Tools	\$0	16.0%
Subcontractor - Installation Hardware	\$0	6.0%
Subcontractor - Audit Applications and Forms	\$0	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$0</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$0	
Labor - Field Verification	\$0	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$0	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$0	10.0%
Subcontractor Labor - Field Verification	\$0	20.0%
Subcontractor Labor - Rebate Processing	\$0	30.0%
Subcontractor Labor - Site Inspections	\$0	20.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$0</i>	<i>100.0%</i>
Total Direct Implementation	\$140,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$3,600	
Labor - EM&V	\$180	5.0%
Materials - EM&V	\$180	5.0%
Subcontractor Labor - EM&V	\$3,240	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$3,600</i>	<i>100.0%</i>
EM&V Overhead	\$400	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$200	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$200	50.0%

Shade Tree Program

Budget Items	Budget	Allocation Rate (%)
<i>Subtotal EM&V Overhead</i>	<i>\$400</i>	<i>100.0%</i>
Total EM&V	\$4,000	
Total Budget	\$160,000	

See accompanying Excel spreadsheet for program budgets.

Shade Tree Program

Appendix 4 – Measure Analysis Worksheet

Yields (kWh)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		</
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DEMAND/ENERGY SAVINGS

Type	Installation Type	Non-Coincident Demand Savings (KW)	Cooling Energy Savings (KWh)	Attrition %	Population Average Annual 20 Year Yield (kWh)
Large Tree (Evergreen Ash)	Yard	0.00	92	30%	65
Large Tree (Evergreen Ash)	Public	0.00	46	30%	32
Medium Tree (Chilean Mesquite)	Yard	0.00	200	30%	140
Medium Tree (Chilean Mesquite)	Public	0.00	110	30%	77
Small Tree (Sweet Acacia)	Yard	0.00	92	30%	65
Small Tree (Sweet Acacia)	Public	0.00	52	30%	36
Conifer Tree (Aleppo Pine)	Yard	0.00	124	30%	87
Conifer Tree (Aleppo Pine)	Public	0.00	57	30%	40

Shade Tree Program

Rates

Class	2006 Rev	2006 kWh sales	Ave \$/kWh	Weight	Weighted Ave \$/kWh
Res	\$335,684,944	3,682,386,133	\$0.0912	90%	\$0.0820
Com	\$199,448,485	1,923,484,002	\$0.1037	10%	\$0.0104
Average customer rate					\$0.0924

Data from Trees for Tucson	
TEP funds pays for trees and delivery.	
Public costs (15 gallon)	\$30
Yard cost (5 gallon)	\$15
Residential plantings	90%
Public Planting	10%
Incentive base on:	
2006 budget	\$78,000
2006 plantings	3381
Average incentive cost per tree	\$23.07

DEMAND/ENERGY SAVINGS				INCENTIVE CALCULATIONS					
Measure	Installation Type	Non-Coincident Demand Savings (KW)	Cooling Energy Savings (KWh)	Therms	IRP PV Benefit (\$)	Social PV Benefit (\$)	Recommended Incentive (\$)	% PV	Program Cost (\$)
Type									
Large Tree (Evergreen Ash)	Yard	0.00	65	0.00	46	61	\$23.00	49%	35
Large Tree (Evergreen Ash)	Public	0.00	32	0.00	23	30	\$23.00	100%	33
Medium Tree (Chilean Mesquite)	Yard	0.00	140	0.00	101	133	\$23.00	23%	35
Medium Tree (Chilean Mesquite)	Public	0.00	77	0.00	55	73	\$23.00	41%	33
Small Tree (Sweet Acacia)	Yard	0.00	65	0.00	46	61	\$23.00	49%	35
Small Tree (Sweet Acacia)	Public	0.00	36	0.00	26	34	\$23.00	89%	33

Shade Tree Program

Conifer Tree (Aleppo Pine)	Yard	0.00	87	0.00	63	82	\$23.00	37%	35
Conifer Tree (Aleppo Pine)	Public	0.00	40	0.00	29	38	\$23.00	80%	33
Weighted Average		0.000	109.056	0.000	78.523	103.407	23.000	0.338	34.381

DEMAND/ENERGY SAVINGS		CUSTOMER COST/SAVINGS				WGT.	% Incent		
Measure Type	Installation Type	Incr. Cost (\$)	Cost Savings		Payback w/Inc. (yrs)	Weighting Factor	(%)	TRC	Societal
			(\$)	wo/Inc.					
Large Tree (Evergreen Ash)	Yard	\$31.50	6	5.3	1.4	0.09	73%	1.3	1.8
Large Tree (Evergreen Ash)	Public	\$30.00	3	10.2	2.4	0.01	77%	0.7	0.9
Medium Tree (Chilean Mesquite)	Yard	\$31.50	13	2.4	0.7	0.54	73%	2.9	3.9
Medium Tree (Chilean Mesquite)	Public	\$30.00	7	4.2	1.0	0.06	77%	1.7	2.2
Small Tree (Sweet Acacia)	Yard	\$31.50	6	5.3	1.4	0.09	73%	1.3	1.8
Small Tree (Sweet Acacia)	Public	\$30.00	3	9.0	2.1	0.01	77%	0.8	1.0
Conifer Tree (Aleppo Pine)	Yard	\$31.50	8	3.9	1.1	0.18	73%	1.8	2.4
Conifer Tree (Aleppo Pine)	Public	\$30.00	4	8.1	1.9	0.02	77%	0.9	1.1
Weighted Average		31.348	10.078	3.578	0.943	1.00000	73%	2.28	3.01

Attachment 7

Attachment 7

Compact Fluorescent Lamp Buydown Program

Compact Fluorescent Lamp Buydown Program

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TEP Compact Fluorescent Lamp Buydown Program

Program Concept and Description

This Program promotes energy efficient Energy Star approved lighting products. Qualified products include compact fluorescent lamps ("CFLs") in a wide range of sizes and configurations. The Program is an up-stream intervention program, and it will operate by soliciting discount pricing from manufacturers and distributing qualifying products through retailers in TEP's service region. Discount pricing from manufacturers will be established through a bid process. Customers will be referred to participating retailers to purchase products. Participating retailers are expected to include home improvement centers, lighting equipment stores, department stores, and supermarkets. Discount pricing will be passed on to consumers through a negotiated agreement with lighting manufacturers and retailers.

TEP will provide consumer education on the benefits of qualifying equipment and will promote the Program through TEP promotional events, the TEP website, vendor advertising and point-of-sale displays. The Program will also provide training to participating retailers on the benefits of qualifying products, promotional activities by TEP, and how to promote the products in store.

Target Market

The target market for this Program is residential and small business customers in TEP's service region.

Current Baseline Conditions

TEP recognizes that the market for CFLs has matured within the last few years. More lamp sizes and configurations are available, and light quality, performance and durability have improved significantly. Pricing has now come down to a level that is more competitive with conventional incandescent lighting. Still, barriers remain to the widespread purchase of CFLs as the standard lamp choice. While TEP has not conducted a formal baseline study and does not have firm data on the current market penetration of CFLs, it is the Company's perception that they still represent a relatively small fraction of the overall screw-in lamp market. This Program is intended to stimulate widespread acceptance of CFLs as the lamp of choice for both replace-on-burnout situations, as well as a means of reducing consumer energy costs. In order to substantiate the baseline assumptions made in the preparation of this plan, TEP is proposing to conduct a formal baseline study but funding for the baseline study will be requested in a separate docket.

Program Eligibility

The Program is available to all TEP customers. It is expected that the bulk of purchases will be made primarily by residential customers and, secondarily, by small business customers. While the Program is targeted at TEP customers, it's expected that there will be some spillover to customers of other neighboring utilities. TEP will employ marketing and delivery strategies that will be designed to limit

Compact Fluorescent Lamp Buydown Program

participation by non-TEP customers. The Program will limit purchases of discounted products to no more than 10 lamps per customer for any one purchase.

Program Rationale

Improving the efficiency of home and small business lighting is an action that TEP customers can understand and take on their own without the need for complex or detailed savings and cost analysis. In addition, while CFL performance has improved and cost has come down in recent years, market barriers still exist to their widespread adoption. Market barriers include the higher cost of lamps compared to incandescent lamps, lingering performance uncertainties, and lack of awareness about the savings and benefits. In addition, the up-stream buydown program design provides price discounts at the point of purchase and eliminates the "hassle factor" that could be associated with alternative program designs such as a rebate program. Experience has shown that an up-stream buydown program design for this technology has been highly effective elsewhere in the state and around the country and is an efficient and highly cost-effective way to promote energy efficient lighting.

Program Objectives

The objectives of the Program are to:

- Reduce peak demand and overall energy consumption in homes and small business facilities;
 - Increase the purchase of CFLs;
 - Increase the availability of energy efficient lighting products in the marketplace; and
 - Increase the awareness and knowledge of retailers and TEP customers on the benefits of energy efficient lighting products.
-

Products and Services Provided

The products and services provided by the Program include:

- Discount pricing of qualified CFLs including screw-in spiral CFL replacements for standard base incandescent lamps, spot and flood CFLs, and dimming CFLs;
 - Education and promotional efforts designed to inform consumers and retailers about the benefits of energy efficient lighting products, including educational brochures, Program promotional material, TEP website content, and point-of-sale displays with promotional materials; and
 - Customer referrals to participating retail outlets.
-

Delivery Strategy and Administration

The strategy to be employed for Program delivery and administration is as follows:

- The Program will be implemented by a third party implementation contractor.
- TEP will solicit participation of lighting manufacturers in the Program through an RFP process. Manufacturers will work directly with their retailers to coordinate Program delivery.
- Implementation contractor responsibilities will include:
 - Soliciting of discount pricing from manufacturers in conjunction with TEP;
 - Identifying and coordinating with selected retail outlets;

Compact Fluorescent Lamp Buydown Program

- Training retail outlet sales and management staff; and
 - Tracking Program progress and reporting to TEP.
- TEP will provide overall Program management, marketing, quality control, and evaluation.
- Key partnering relationships include:
 - The implementation contractor;
 - Lighting manufacturers;
 - Lighting retailers;
 - Local organizations that can help promote the Program; and
 - The Arizona Energy Office to provide training, education and awareness.

The Program implementation flow chart is included in Appendix 1.

Marketing and Communications

The marketing and communications strategy will include the following components:

- TEP will provide Program marketing and customer awareness building through a range of strategies including:
 - Promotions on the TEP website about the benefits of purchasing energy efficient lighting products and announcement of special pricing and promotional events;
 - Advertising in major newspapers and other selected print media in the TEP service region to raise awareness of the availability of the Program and attract customers to retail outlets;
 - Working with the implementation contractors to develop and coordinate point-of-sale advertising at participating retail outlets;
 - Providing information through TEP's customer care center; and
 - General ongoing promotion of the Energy Star label and the value of Energy Star lighting and appliances.
- The implementation contractor will provide general program marketing in conjunction with TEP marketing efforts including:
 - Development of point-of-sale marketing pieces and coordination of point-of-sale marketing displays with participating retailers including aisle end cap displays, signage, brochures and other point-of-sale collateral pieces to promote the benefits of qualifying products and announce special pricing and promotional events;
 - Scheduling and coordination of special pricing and promotional events with participating retailers;
 - Assistance with responding to customer inquiries about the Program and where to purchase qualifying products; and
 - Training participating retailers on communicating the availability and benefits of qualifying products to their customers.
- The advertising campaign will communicate that energy efficient lighting products will help reduce customer energy bills, provide equal or better lighting output and quality, last up to 10 times longer requiring fewer replacements, and are beneficial for the environment.

Compact Fluorescent Lamp Buydown Program

Program Implementation Schedule

Table 1 shows the estimated timeline for key Program activities by quarter.

Table 1. Implementation Schedule

Program Activities	2007				2008				2009			
Submit Program for approval												
Program approval (estimated)												
Prepare and submit RFP												
Selection of implementation contractors												
Selection of lighting manufacturers												
Create marketing materials and campaign												
Program kick-off and implementation												
Special promotional and pricing campaigns												
Process evaluation												
Measure verification and impact evaluation												
Redesign design Program as needed												

Measurement, Evaluation and Research Plan

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for Program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of Program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective Program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the Program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the Program and periodically review and revise the savings values to be consistent with Program participation and accurately estimate the savings being achieved by the Program.

This approach will provide TEP with ongoing feedback on Program progress and enable management to adjust or correct the Program measures to be more effective, provide a higher

Compact Fluorescent Lamp Buydown Program

level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Program Budget

The annual budget of approximately \$700,000 will be allocated as shown in Table 2, while Table 3 provides the expected Program budgets through 2012 which includes an escalation rate of 3% per year. Appendix 2 provides addition details on the 2008 budget.

Table 2. 2008 Program Budget

Total Program Budget	\$700,000
Total Administrative Cost Allocation	
Managerial & Clerical	\$17,448
Travel & Direct Expenses	\$914
Overhead	\$37,638
Total Administrative Cost	\$56,000
Total Marketing Allocation	
Internal Marketing Expense	\$42,000
Subcontracted Marketing Expense	\$42,000
Total Marketing Cost	\$84,000
Total Direct Implementation	
Financial Incentives to Upstream Participants	\$473,480
Support Activity Labor	\$0
Hardware & Materials	\$5,320
Rebate Processing & Inspection	\$53,200
Total Direct Installation Cost	\$532,000
Total EM&V Cost Allocation	
EM&V Activity	\$15,684
EM&V Overhead	\$12,316
Total EM&V Cost	\$28,000

Table 3. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total budget	\$700,000	\$721,000	\$742,630	\$764,909	\$787,856
Incentives	\$473,480	\$487,684	\$502,315	\$517,384	\$532,906
Administrative Costs	\$226,520	\$233,316	\$240,315	\$247,525	\$254,950
Incentives as % of budget	67.6%	67.6%	67.6%	67.6%	67.6%

Estimated Energy Savings

The Program offers manufacturer incentives on a range of integral CFL lamps, from 13 to 55 watts. Table 4 provides the assumed base lamp wattage, and corresponding CFL wattages as recommended by manufacturers. This table also provides the expected demand and energy savings, based on an anticipated 854 hours of annual usage.

Compact Fluorescent Lamp Buydown Program

Table 4. Projected Lamp Sales and Capacity and Energy Benefits

DEMAND/ENERGY SAVINGS								
Fixture Type	Inc. Fixture Watt Range	Inc. Fixture Watts*	CFL Fixture Watt Range	CFL Fixture Lumen Range	CFL Fixture Watts*	Non-Coincident Demand Savings (KW)	On-peak Energy Savings (KWh)	Off-peak Energy Savings (KWh)
ES Integral CFL	40	40	13-19	450 to 799	16	0.024	4	17
	60	60	20-24	800 to 1099	22	0.038	6	27
	75	75	25-30	1100 to 2599	27	0.048	7	33
	100	100	32-55	2600 or Greater	43	0.057	9	40

Table 5 shows estimated energy savings from this Program for program years 2008 through 2012, while Table 6 shows the projected annual environmental benefits. See Appendix 3 for more information about estimated energy savings for each measure, and the weighted average savings based on projected lamp market participation.

Table 5. Projected Lamp Sales and Capacity and Energy Benefits

Year	2008	2009	2010	2011	2012
Projected Lamp Sales	305,471	314,635	324,074	333,796	343,810
Non-coincident peak (kW)	11,470	11,815	12,169	12,534	12,910
Coincident peak (kW)	1,147	1,181	1,217	1,253	1,291
Energy Savings (kWh)	9,796,898	10,090,805	10,393,530	10,705,335	11,026,495

Table 6. Projected Environmental Benefits, 2008 - 2012

Water Savings	26,006,532	Gallons
SOx	124,311	Lbs
NOx	206,492	Lbs
CO2	108,603,278	Lbs

Program Cost Effectiveness

The cost effectiveness of each measure and each program as a whole was assessed using the Total Resource Cost ("TRC") test, the Societal Cost ("SC") test and the Ratepayer Impact Measure ("RIM") test. Measure analysis worksheets showing all energy savings, cost and cost-effectiveness calculations are included in Appendix 3.

The cost effectiveness analysis requires estimation of:

- net demand and energy savings attributable to the program;
- net incremental cost to the customer of purchasing qualifying products;
- TEP's Program administration costs;
- the present value of Program benefits including TEP avoided costs over the life of the measures;
- and
- TEP lost revenues.

Compact Fluorescent Lamp Buydown Program

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data. Table 7 summarizes data used in the cost effectiveness analysis and the data sources.

Table 7. Cost-Effectiveness Analysis Assumptions

Conservation Life (yrs):	7.3
Program Life (yrs):	5
Demand AC (\$/kW):	\$111.90
Summer Energy AC (\$/kWh):	\$0.07100
Winter Energy AC (\$/kWh):	\$0.05170
Ratio of Non-inc to Incentive Costs	47.8%
IRP Discount Rate:	8.50%
Social Discount Rate	5.00%
NTG Ratio:	60%

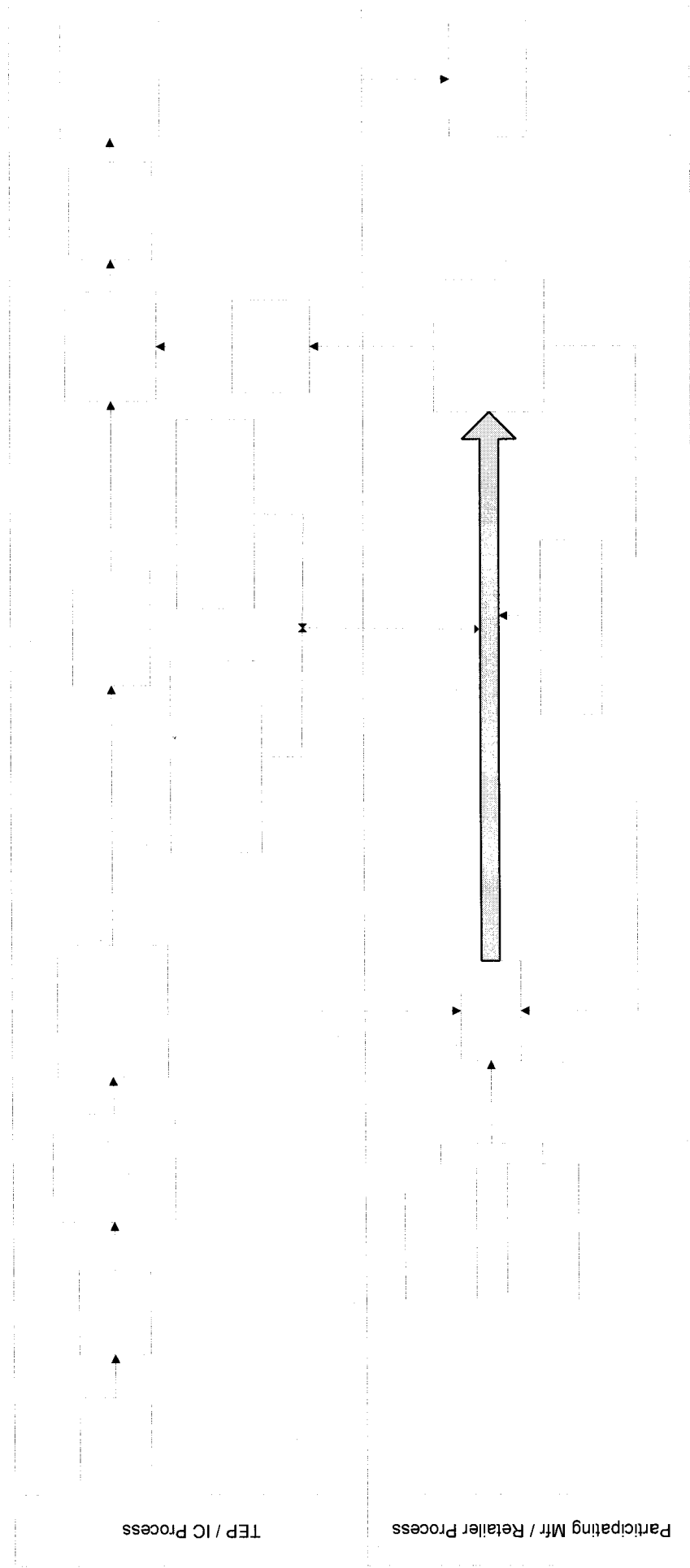
Table 8 provides a summary of the benefit/cost analysis results for this Program. A detailed benefit/cost analysis is presented in Appendix 3.

Table 8. Benefit/Cost Analysis Results Summary

Cost Effectiveness Tests	TRC	SC	RIM
Benefit/Cost Ratio	2.05	2.33	0.48

Compact Fluorescent Lamp Buydown Program

Appendix 1 – CFL Buydown Program Implementation Process



Compact Fluorescent Lamp Buydown Program

Appendix 2 – Program Budgets

See accompanying Excel spreadsheet for 2008-2012 Program budgets.

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$17,448	
Labor - Clerical	\$872	5.0%
Labor - Program Design	\$872	5.0%
Labor - Program Development	\$872	5.0%
Labor - Program Planning	\$2,617	15.0%
Labor - Program/Project Management	\$1,745	10.0%
Labor - Staff Management	\$1,745	10.0%
Labor - Staff Supervision	\$872	5.0%
Subcontractor Labor - Clerical	\$872	5.0%
Subcontractor Labor - Program Design	\$1,745	10.0%
Subcontractor Labor - Program Development	\$872	5.0%
Subcontractor Labor - Program Planning	\$872	5.0%
Subcontractor Labor - Program/Project Management	\$3,490	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$17,448</i>	<i>100.0%</i>
Travel & Direct Expenses	\$914	
Conference Fees	\$274	30.0%
Labor - Conference Attendance	\$183	20.0%
Subcontractor - Conference Fees	\$18	2.0%
Subcontractor - Travel - Airfare	\$37	4.0%

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
Subcontractor - Travel - Lodging	\$0	0.0%
Subcontractor - Travel - Meals	\$0	0.0%
Subcontractor - Travel - Mileage	\$0	0.0%
Subcontractor - Travel - Parking	\$0	0.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$73	8.0%
Subcontractor Labor - Conference Attendance	\$18	2.0%
Travel - Airfare	\$128	14.0%
Travel - Lodging	\$55	6.0%
Travel - Meals	\$27	3.0%
Travel - Mileage	\$9	1.0%
Travel - Parking	\$0	0.0%
Travel - Per Diem for Misc. Expenses	\$91	10.0%
<i>Subtotal Travel and Direct Expenses</i>	<i>\$914</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$37,638	
Equipment - Communications	\$753	2.0%
Equipment - Computing	\$753	2.0%
Equipment - Document Reproduction	\$753	2.0%
Equipment - General Office	\$753	2.0%
Equipment - Transportation	\$753	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$376	1.0%
Labor - Accounts Receivable	\$376	1.0%
Labor - Administrative	\$376	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$376	1.0%

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
Labor - Contract Reporting	\$376	1.0%
Labor - Corporate Services	\$376	1.0%
Labor - Facilities Maintenance	\$376	1.0%
Labor - Information Technology	\$376	1.0%
Labor - Materials Management	\$376	1.0%
Labor - Procurement	\$376	1.0%
Labor - Regulatory Reporting	\$15,055	40.0%
Labor - Shop Services	\$376	1.0%
Labor - Telecommunications	\$376	1.0%
Labor - Transportation Services	\$376	1.0%
Office Supplies	\$376	1.0%
Postage	\$376	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$13,173	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$37,638</i>	<i>100.0%</i>
Total Administrative Costs	\$56,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$42,000	
Advertisements / Media Promotions	\$10,500	25.0%
Bill Inserts	\$1,680	4.0%
Brochures	\$2,520	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$2,100	5.0%
Labor - Customer Outreach	\$2,100	5.0%
Labor - Customer Relations	\$2,100	5.0%
Labor - Marketing	\$12,600	30.0%
Print Advertisements	\$6,300	15.0%
Radio Spots	\$2,100	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$42,000</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$42,000	
Subcontractor - Bill Inserts	\$2,100	5.0%

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
Subcontractor - Brochures	\$2,100	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$4,200	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$2,100	5.0%
Subcontractor Labor - Customer Outreach	\$2,100	5.0%
Subcontractor Labor - Customer Relations	\$2,100	5.0%
Subcontractor Labor - Marketing	\$2,100	5.0%
Television Spots	\$0	0.0%
Website Development	\$25,200	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$42,000</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$84,000	
Direct Implementation		
Financial Incentives to Customers	\$473,480	
Activity - Labor	\$0	
Labor - Curriculum Development	\$0	8.0%
Labor - Customer Education and Training	\$0	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$0	30.0%
Subcontractor Labor - Facilities Audits	\$0	10.0%
Subcontractor Labor - Curriculum Development	\$0	5.0%
Subcontractor Labor - Customer Education and Training	\$0	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$0	2.0%

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
<i>Subtotal Activity</i>	<i>\$0</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$5,320	
Audit Applications and Forms	\$426	8.0%
Direct Implementation Literature	\$1,064	20.0%
Education Materials	\$1,064	20.0%
Energy Measurement Tools	\$532	10.0%
Installation Hardware	\$532	10.0%
Subcontractor - Direct Implementation Literature	\$213	4.0%
Subcontractor - Education Materials	\$213	4.0%
Subcontractor - Energy Measurement Tools	\$851	16.0%
Subcontractor - Installation Hardware	\$319	6.0%
Subcontractor - Audit Applications and Forms	\$106	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$5,320</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$53,200	
Labor - Field Verification	\$5,320	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$5,320	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$5,320	10.0%
Subcontractor Labor - Field Verification	\$10,640	20.0%
Subcontractor Labor - Rebate Processing	\$15,960	30.0%
Subcontractor Labor - Site Inspections	\$10,640	20.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$53,200</i>	<i>100.0%</i>
Total Direct Implementation	\$532,000	
Evaluation, Measurement and Verification		

Compact Fluorescent Lamp Buydown Program

Budget Items	Budget	Allocation Rate (%)
EM&V Labor and Materials	\$15,684	
Labor - EM&V	\$784	5.0%
Materials - EM&V	\$784	5.0%
Subcontractor Labor - EM&V	\$14,115	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$15,684</i>	<i>100.0%</i>
EM&V Overhead	\$12,316	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$6,158	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$6,158	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$12,316</i>	<i>100.0%</i>
Total EM&V	\$28,000	
Total Budget	\$700,000	

Compact Fluorescent Lamp Buydown Program

Appendix 3 – Measure Level Energy Savings and Benefit Cost Calculations

DEMAND/ENERGY SAVINGS										INCENTIVE CALCULATIONS				
Fixture Type	Inc. Fixture Watt Range	Inc. Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Lumen Range	CFL Fixture Watts*	Non-Coincident Demand Savings (KW)	On-pk Energy Savings (KWh)	Off-pk Energy Savings (KWh)	IRP PV Benefit (\$)	Social PV Benefit (\$)	Recommended Incentive (\$)	% PV	PV Program Cost (\$)	NPV (\$)
ES Integral CFL	40	40	13-19	450 to 799	16	0.024	4	17	5	6	1.00	19%	3	2
	60	60	20-24	800 to 1099	22	0.038	6	27	8	10	1.50	18%	4	4
	75	75	25-30	1100 to 2599	27.5	0.048	7	33	10	12	2.00	19%	5	6
	100	100	32-55	2600 or Greater	43.5	0.057	9	40	12	14	2.50	20%	6	7
	Weighted Average					0.038	5.72	26.35	8.28	9.40	1.55	19%	4.04	4.24

DEMAND/ENERGY SAVINGS										CUSTOMER COST/SAVINGS				B/C	
Fixture Type	Inc. Fixture Watt Range	Inc. Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	CFL Fixture Watt Range	WGT.	% Incent	Weighting		TRC	Societal
												Factor	(%)		
ES Integral CFL	40	40	13-19	4.45	2	2.7	2.1	30.00%	22%	1.7	1.9				
	60	60	20-24	5.34	3	2.0	1.5	40.00%	28%	2.1	2.4				
	75	75	25-30	6.48	3	2.0	1.4	20.00%	31%	2.2	2.5				
	100	100	32-55	7.24	4	1.9	1.2	10.00%	35%	2.2	2.6				
	Weighted Average			5.49	3	2.19	1.60	100%	28%	2.05	2.33				

Compact Fluorescent Lamp Buydown Program

Incremental costs

Wattage range	Average Incremental Cost (retail)
13-19	\$4.45
20-24	\$5.34
25-30	\$6.48
32-55	\$7.24

2005 DEER costs and price survey adjustments

Measure ID	Category	Measure Name	Measure Description	Base Description	Incremental Equipment Cost	Cost Unit
D03-801	LTG	7-13 Watt Integral CFL	7-13 Watt < 800 Lumens - screw-in	40W Incandescent	\$4.13	Lamp
D03-801	LTG	7-13 Watt Integral CFL	7-13 Watt < 800 Lumens - screw-in	40W Incandescent	\$3.37	Lamp
D03-802	LTG	13 Watt Integral CFL	13 Watt ≥ 800 Lumens - screw-in	60W Incandescent	\$4.00	Lamp
D03-802	LTG	13 Watt Integral CFL	13 Watt ≥ 800 Lumens - screw-in	60W Incandescent	\$3.25	Lamp
D03-803	LTG	14 Watt Integral CFL	14 Watt - screw-in	60W Incandescent	\$4.35	Lamp
D03-803	LTG	14 Watt Integral CFL	14 Watt - screw-in	60W Incandescent	\$3.55	Lamp
D03-804	LTG	15 Watt Integral CFL	15 Watt - screw-in	60W Incandescent	\$4.70	Lamp
D03-804	LTG	15 Watt Integral CFL	15 Watt - screw-in	60W Incandescent	\$3.84	Lamp
D03-805	LTG	16 Watt Integral CFL	16 Watt - screw-in	60W Incandescent	\$5.05	Lamp
D03-805	LTG	16 Watt Integral CFL	16 Watt - screw-in	60W Incandescent	\$4.14	Lamp
D03-806	LTG	18 Watt Integral CFL	18 Watt < 1,100 Lumens - screw-in	60W Incandescent	\$5.75	Lamp
D03-806	LTG	18 Watt Integral CFL	18 Watt < 1,100 Lumens - screw-in	60W Incandescent	\$4.72	Lamp
D03-807	LTG	18 Watt Integral CFL	18 Watt ≥ 1,100 Lumens - screw-in	75W Incandescent	\$5.40	Lamp
D03-807	LTG	18 Watt Integral CFL	18 Watt ≥ 1,100 Lumens - screw-in	75W Incandescent	\$4.43	Lamp

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D03-808	LTG	19 Watt Integral CFL	19 Watt ≥1,100 Lumens - screw-in	75W Incandescent	\$5.73	Lamp
D03-808	LTG	19 Watt Integral CFL	19 Watt ≥1,100 Lumens - screw-in	75W Incandescent	\$4.71	Lamp
D03-809	LTG	20 Watt Integral CFL	20 Watt - screw-in	75W Incandescent	\$6.07	Lamp
D03-809	LTG	20 Watt Integral CFL	20 Watt - screw-in	75W Incandescent	\$4.99	Lamp
D03-810	LTG	23 Watt Integral CFL	23 Watt - screw-in	100W Incandescent	\$5.67	Lamp
D03-810	LTG	23 Watt Integral CFL	23 Watt - screw-in	100W Incandescent	\$4.66	Lamp
D03-811	LTG	25 Watt Integral CFL	25 Watt <1,600 Lumens - screw-in	75W Incandescent	\$7.73	Lamp
D03-811	LTG	25 Watt Integral CFL	25 Watt <1,600 Lumens - screw-in	75W Incandescent	\$6.38	Lamp
D03-812	LTG	25 Watt Integral CFL	25 Watt ≥1,600 Lumens - screw-in	100W Incandescent	\$6.21	Lamp
D03-812	LTG	25 Watt Integral CFL	25 Watt ≥1,600 Lumens - screw-in	100W Incandescent	\$5.11	Lamp
D03-813	LTG	26 Watt Integral CFL	26 Watt <1,600 Lumens - screw-in	75W Incandescent	\$8.06	Lamp
D03-813	LTG	26 Watt Integral CFL	26 Watt <1,600 Lumens - screw-in	75W Incandescent	\$6.66	Lamp
D03-814	LTG	26 Watt Integral CFL	26 Watt ≥1,600 Lumens - screw-in	100W Incandescent	\$6.48	Lamp
D03-814	LTG	26 Watt Integral CFL	26 Watt ≥1,600 Lumens - screw-in	100W Incandescent	\$5.34	Lamp
D03-815	LTG	28 Watt Integral CFL	28 Watt - screw-in	100W Incandescent	\$7.02	Lamp
D03-815	LTG	28 Watt Integral CFL	28 Watt - screw-in	100W Incandescent	\$5.79	Lamp
D03-816	LTG	32 Watt Integral CFL	32 Watt - screw-in	100W Incandescent	\$8.11	Lamp
D03-816	LTG	32 Watt Integral CFL	32 Watt - screw-in	100W Incandescent	\$6.70	Lamp
D03-817	LTG	36 Watt Integral CFL	36 Watt - screw-in	150W Incandescent	\$6.54	Lamp
D03-817	LTG	36 Watt Integral CFL	36 Watt - screw-in	150W Incandescent	\$5.14	Lamp
D03-818	LTG	50 Watt Integral CFL	50 Watt - screw-in	150W Incandescent	\$9.89	Lamp
D03-818	LTG	50 Watt Integral CFL	50 Watt - screw-in	150W Incandescent	\$7.94	Lamp

Effective useful life

Average sample rated life (hours)	8,308
Rated life degradation factor	25%
Adjusted rated life	6,231
Annual op hours	854
Effective useful life (years)	7.30

Measure level spreadsheet for program benefit/cost calculations available electronically upon request.

Attachment 8

Non-Residential Existing Facilities Program

Attachment 8

Non-Residential Existing Facilities Program

Non-Residential Existing Facilities Program

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TEP Non-Residential Existing Facilities Program

Program Concept and Description

The Existing Facilities Program provides prescriptive incentives to large commercial customers who qualify for TEP's pricing plans Rate 13 and Rate 14 (typically an aggregate demand exceeding 200 kW) for the installation of energy-efficiency measures including lighting equipment and controls, HVAC equipment, motors and motor drives, compressed air and refrigeration measures. Prescriptive incentives are offered for a schedule of measures in each of these categories. The program also provides customers with the opportunity to propose innovative energy efficiency solutions by offering a custom energy efficiency measure. The schedule of measures and incentives is provided in the following sections.

The viability of each of the prescriptive measures has been assessed through a cost-effectiveness analysis according to the Total Resource Cost ("TRC"), Ratepayer Impact Measure ("RIM") and Societal Cost ("SC") tests. The cost-effectiveness tests account for the energy and demand savings of each measure, the associated avoided costs and net benefits to TEP, the customer incremental or installed costs, and the program administration costs. The custom measure is designed so that each project that is approved must meet the SC and TRC test.

The program includes consumer educational and promotional pieces designed to assist facility operators and decision makers with the information necessary to improve the energy efficiency of the lighting, HVAC, motor and refrigeration systems in their facilities. The program includes customer and trade ally education to assist with understanding of what technologies are being promoted, what incentives are offered, and how the program functions.

Appendix 1 provides a program logic diagram.

Program Objectives

The primary goal of the program is to encourage TEP's non-residential customers to install energy efficiency measures in existing facilities. More specifically, the program is designed to:

- Provide incentives to facility operators for the installation of high-efficiency lighting equipment and controls, HVAC equipment, premium efficiency motors and motor controls, energy efficient compressed air and leak-repair measures, and energy-efficient refrigeration system retrofits (see Table 1 for the schedule of measures and incentives);
- Overcome market barriers including;
 - Lack of awareness and knowledge about the benefits and cost of energy efficiency improvements,
 - Performance uncertainty associated with energy efficiency projects, and
 - High first costs for energy efficiency measures;
- Assure that the participation process is clear, easy to understand and simple: and
- Increase the awareness and knowledge of facility operators, managers and decision-makers on the benefits of high-efficiency equipment and systems.

Program Rationale

Certain barriers exist to the adoption of energy efficiency measures including lack of investment capital, competition for funds with other capital improvements, lack of awareness/knowledge about the benefits and costs of energy efficiency measures, high transaction and information search costs, and technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in the market.

In addition to helping customers reduce and manage their energy costs, this program provides other societal and customer benefits including reduced greenhouse gas emissions, improved levels of service from energy expenditures, and lower overall rates and energy costs compared to other resource options.

Target Market and Eligibility Requirements

All large commercial customers who qualify for TEP's Rate 13 and Rate 14 (typically an aggregate demand exceeding 200 kW) are eligible for the program. Customers must be in the TEP service region that receive electric service from TEP are eligible to participate in the program. Existing systems that are being replaced on burnout (ROB) or prior to failure (RET) and systems installed during new construction (NEW) projects are all eligible for the program.

Estimate of Baseline Conditions

TEP has not conducted a formal baseline study of the existing non-residential market. However, in preparing the analysis of each of the measures included in this plan, the baseline performance conditions of each technology were estimated based on best available knowledge of current market conditions and technology applications. Resources used for the estimation of both baseline and energy efficiency technology performance and cost included (i) the California DEER database; (ii) detailed engineering modeling and simulation specific to the desert southwest climate; (iii) data from recognized industry resources such as the CEE and ASHRAE; (iv) manufacturers data; and (v) data accumulated from similar analysis for other regional utilities. In order to substantiate the baseline assumptions made in the preparation of this plan, TEP is proposing to conduct a formal baseline study but funding for the baseline study will be requested in a separate docket from this DSM Portfolio Plan.

Application and cost basis designators were used to determine which cost elements are used for each measure. The application designation is important because it helps to define what type of cost estimate is needed by identifying the types of projects where the measure is expected to be applied. There are three application codes that have been used:

- **Retrofit (RET)** – Replacing a working system with a new technology before the end of its useful life, or installing a technology that was not there before. The cost basis for this application is typically installed cost;
- **Replace-on-burnout (ROB)** – Replacing a technology at the end of its useful life. The cost basis for this application is typically the incremental cost of a more efficient technology compared to a less efficient baseline technology and

Non-Residential Existing Facilities Program

- **New construction (NEW)** – Installing a technology in a new construction or major renovation project. The cost basis for this application is also typically the incremental cost of a more efficient technology compared to a less efficient baseline technology.

The cost basis designator is used for each measure, if the appropriate cost is the incremental or installed cost. The cost basis is determined by: a) the application (RET, ROB, or NEW) and b) whether it is displacing an existing technology, installed in the absence of an existing technology, or is an alternative to a competing technology. The cost basis designation is used to define whether the cost is:

- **Incremental** – the differential cost between a base technology and an energy-efficient technology; or
- **Installed** – the full or installed cost of the measure including equipment, labor, overhead & profit (OH&P).

Products and Services Provided

The Existing Facilities Program is a customer incentive program design that provides rebates for the installation of energy efficiency measures in existing non-residential facilities. More specifically, the program offers the following products and services:

- Consumer educational and promotional pieces designed to assist facility operators and decision makers with the information necessary to improve the energy efficiency of lighting, HVAC, motor and refrigeration systems;
- Education and promotional efforts for customers and trade allies on how the program functions, what energy efficiency technologies are offered, what incentives are provided and the benefits of the measures;
- Prescriptive incentives to encourage the adoption of energy efficiency measures. Prescriptive measures and incentives provided by the program are included in the tables below.

Table 1 provides average incentive per unit and unit definition. These are expected incentive levels based on market participation. Specific incentive levels for certain items where a variety of configurations are possible such as lighting, can be found in the measure analysis worksheets.

Table 1. Prescriptive Incentives

Measure Description	Average Unit Incentive (\$)	Target Unit Definition
Retrofit T12 Systems with T8 Systems and Electronic Ballasts	\$10	Fixture
Delamping	\$15	Fixture
Retrofit HID Systems with Linear Fluorescent T8 and T5 Systems	\$125	Fixture
Retrofit Incandescent to Integral Compact Fluorescent Lighting (CFL)	\$2	Lamp
Cold Cathode CFL retrofit	\$3	Lamp
Energy Efficient Exit Signs	\$25	Sign
Occupancy Sensors on Lighting	\$30	Connected kW
Daylighting Controls	\$120	Connected kW
Energy Efficient Outdoor CFL Lighting	\$2	Lamp

Non-Residential Existing Facilities Program

Measure Description	Average Unit Incentive (\$)	Target Unit Definition
Anti-Sweat Heater Controls	\$200	Case
High Efficiency Evaporator Fan Motors	\$35	Motor
High Efficiency Reach-in Refrigerators and Freezers	\$170	Unit
High Efficiency Ice Makers	\$50	Unit
Strip Curtains and Night Covers	\$7	Linear ft.
Occupancy Sensor Vending Machine and Reach-in Cooler Controls	\$75	Unit
H210 - Energy Efficient Water Cooled Chiller	\$40	Ton
H211 -- Energy Efficient Air Cooled Chillers	\$25	Ton
Energy Efficient Packaged & Split Air Conditioners - SEER Rated	Equip <11.25 ton = \$40/ton Equip > 11.25 ton = \$25/ton Efficiency Incentive = \$15/ton	
Energy Efficient Packaged and Split Heat Pumps - SEER Rated		
Energy Efficient Packaged Air Conditioners - EER Rated*	Equip <11.25 ton = \$50/ton Equip > 11.25 ton = \$25/ton Efficiency Incentive = \$75/ton	
Energy Efficient Heat Pumps - EER Rated		
Programmable Thermostats (Heating Setback / Cooling Setup)	\$50	T-stat
Energy Efficient ODP Motors	\$3	Hp
Energy Efficient TEFC Motors	\$3	Hp
Variable Speed Drives	\$50	Hp
Variable-Speed Lubricant-Injected Rotary Screw Compressors	\$50	Hp

- Custom incentives to encourage customers to propose innovative energy efficiency solutions not covered by the schedule of prescriptive measures are also available. Eligible projects must compare a baseline design or system to a more energy efficient alternative and provide calculations and documentation substantiating the savings claims. Projects that are eligible for custom incentives are evaluated on a case-by-case basis and each project must pass the SC and TRC test based on estimated demand and energy savings, customer incremental or installed cost, and the overall life of the measure. The custom incentive is:

Custom incentive = \$0.10 per annual kWh saved

Program Delivery Strategy

The Existing Facilities Program is a comprehensive efficiency retrofit program and will be implemented by employing the services of a qualified implementation contractor. The implementation contractor will be sought through a competitive bidding process which will require TEP to issue an RFP to professional services companies who are active in the field of DSM program implementation. TEP will assign an in-house program manager to oversee the activities of the implementation contractor, provide guidance on program activities that is consistent with TEP's goals and customer service requirements, provide a single contact point for customers who are interested in or have concerns about the program, and provide overall quality control and management of the delivery process.

Non-Residential Existing Facilities Program

The implementation contractor will provide program administration, application, participation tracking and reporting, project quality control, and technical support. In addition to the implementation contractor, key partnering relationships include: the local architectural and engineering community; electrical, mechanical and building contractors; equipment manufacturers, distributors and vendors; professional and trade service associations; and the Arizona Energy Office. As part of the implementation plan, TEP will conduct outreach to each of these partner groups, and provide education and training on the benefits and functioning of the program.

Program Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to key partners and trade allies including the architecture/engineering and contractor community, relevant professional and trade associations and other parties of interest in the market. An important part of the marketing plan will be content and functionality on the TEP website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars implemented in each market to provide details about how to participate in the Program. The seminars will be tailored to the needs of business owners, building manager, architects, engineers, vendors, and contractors;
- A combination of strategies including major media advertising, outreach and presentations at professional and community forums and events, and through direct outreach to key customers and customer representatives. Marketing activities will include:
 - Brochures that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the call center and TEP.com and will be available for various public awareness events (presentations, seminars etc);
 - Targeted mailing used to educate customers on the benefits of the program and explain how they can apply;
 - Customer and trade partner outreach and presentations (e.g. BOMA, ASHRAE) informing interested parties about the benefits of the program and how to participate;
 - Print advertisements to promote the program placed in selected local media including the Tucson area newspapers and trade publications;
 - Website content at TEP.com providing program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources;
 - TEP customer care representatives trained to answer any customer questions regarding the program;
 - Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials; and
 - Presentations by the program manager to key customers and customer groups to actively solicit their participation in the program.
- The marketing strategy will identify key customer segments and groups for target marketing including the University of Arizona, school districts, and the Davis-Monthan Air Force Base and prepare specific outreach activities for these customers;

Non-Residential Existing Facilities Program

- TEP will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program;
- The implementation contractor will be responsible for assisting with program promotion including customer contact, attendance at public presentations and events, and be the primary contact point from the website and other promotional materials.

Program Implementation Schedule

The program implementation schedule is summarized in Table 2.

Table 2. Existing Facilities Program Implementation Schedule

Program Activities	2007			2008			2009		
New program submitted to ACC for approval									
New program approval (estimated)									
Implementation contractor RFPs issued									
Implementation contractors selected									
Marketing and communications plan prepared (including collateral materials)									
Implementation plan prepared									
Program kick-off and marketing campaign launched									
Program implementation and delivery									
MER impact and cost-effectiveness analysis									
MER process evaluation									
Progress reporting to ACC									
Program redesign as needed									

Estimated Participation and Demand and Energy Savings

Total annual demand and energy savings goals are presented in Table 3. Appendix 3 provides further information about estimated energy savings for each measure category, including the measure and program level benefit cost analysis. Appendix 3 also provides a view of the expected project technology mix for 2008, which is considered to be the template for all program years.

Table 3. Projected Capacity and Energy Benefits

Annual Incremental Savings	2008	2009	2010	2011	2012
Non-coincident peak (kW)	1,896	1,953	2,012	2,072	2,134
Coincident peak (kW)	1,665	1,715	1,767	1,820	1,874
Energy Savings (kWh)	9,986,354	10,285,945	10,594,523	10,912,359	11,239,730

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2007 – 2012 shown in Table 4:

Non-Residential Existing Facilities Program

Table 4. Projected Environmental Benefits, 2008 - 2012

Water Savings	26,509,456	Gallons
SOx	126,715	Lbs
NOx	210,485	Lbs
CO2	110,703,489	Lbs

Program Cost Effectiveness

Table 5 provides a summary of the benefit/cost analysis results for this program. A benefit/cost analysis summary of all measures is presented in Appendix 3.

Table 5. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	SC	RIM
Benefit/Cost Ratio	3.04	3.74	0.90

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Table 6. Because the program consists of a variety of measure, each with a unique avoided cost and economic useful life, these metrics are not provided in Table 6 but can be found in the individual measure analysis worksheets.

Table 6. Other Financial Assumptions

Ratio of Non-inc to Incentive Costs	83.2%
TRC Discount Rate	8.50%
Social Discount Rate	5.00%
Weighted Average NTG Ratio:	75%

Program Costs (Budget)

The annual budget of approximately \$700,000 will be allocated as shown in Table 7, while Table 8 provides the expected program budgets through 2012. Appendix 1 provides addition details on the 2008 budget.

Table 7. 2008 Program Budget

Total Program Budget	\$700,000
Total Administrative and O&M Cost Allocation	\$126,000
Managerial & Clerical	\$100,800
Travel & Direct Expenses	\$15,120
Overhead	\$10,080
Total Marketing Allocation	\$84,000
Internal Marketing Expense	\$42,000
Subcontracted Marketing Expense	\$42,000
Total Direct Implementation	\$455,000

Non-Residential Existing Facilities Program

Financial Incentives	\$382,200
Support Activity Labor	\$18,200
Hardware & Materials	\$9,100
Rebate Processing & Inspection	\$45,500
Total EM&V Cost Allocation	\$35,000
EM&V / Research Activity	\$33,250
EM&V Overhead	\$1,750

Table 8. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total Budget	\$700,000	\$721,000	\$742,630	\$764,909	\$787,856
Incentives	\$382,200	\$393,666	\$405,476	\$417,640	\$430,169
Administrative Costs	\$317,800	\$327,334	\$337,154	\$347,269	\$357,687
Incentives as % of Budget	54.6%	54.6%	54.6%	54.6%	54.6%

Measurement, Evaluation, and Research

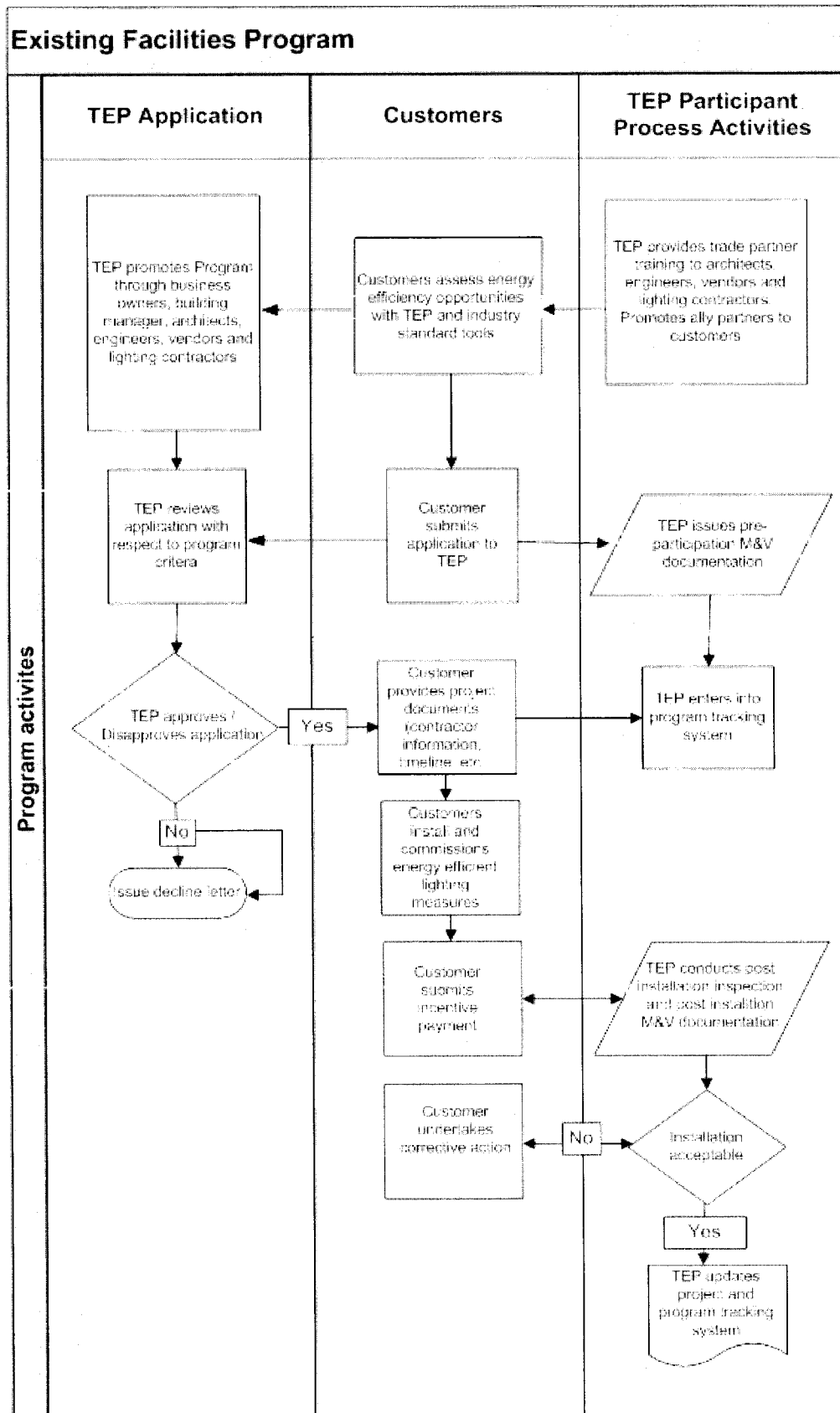
TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

Non-Residential Existing Facilities Program

Appendix 1 – Non-Residential Existing Facilities Implementation Process



Non-Residential Existing Facilities Program

Appendix 2 – Program Costs

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$100,800	
Labor - Clerical	\$5,040	5.0%
Labor - Program Design	\$5,040	5.0%
Labor - Program Development	\$5,040	5.0%
Labor - Program Planning	\$15,120	15.0%
Labor - Program/Project Management	\$10,080	10.0%
Labor - Staff Management	\$10,080	10.0%
Labor - Staff Supervision	\$5,040	5.0%
Subcontractor Labor - Clerical	\$5,040	5.0%
Subcontractor Labor - Program Design	\$10,080	10.0%
Subcontractor Labor - Program Development	\$5,040	5.0%
Subcontractor Labor - Program Planning	\$5,040	5.0%
Subcontractor Labor - Program/Project Management	\$20,160	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$100,800</i>	<i>100.0%</i>
Travel & Direct Expenses	\$15,120	
Conference Fees	\$1,512	10.0%
Labor - Conference Attendance	\$1,512	10.0%
Subcontractor - Conference Fees	\$302	2.0%
Subcontractor - Travel - Airfare	\$605	4.0%
Subcontractor - Travel - Lodging	\$302	2.0%
Subcontractor - Travel - Meals	\$302	2.0%
Subcontractor - Travel - Mileage	\$302	2.0%
Subcontractor - Travel - Parking	\$302	2.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$1,361	9.0%
Subcontractor Labor - Conference Attendance	\$302	2.0%
Travel - Airfare	\$2,117	14.0%
Travel - Lodging	\$1,512	10.0%
Travel - Meals	\$756	5.0%
Travel - Mileage	\$756	5.0%
Travel - Parking	\$454	3.0%
Travel - Per Diem for Misc. Expenses	\$2,722	18.0%
<i>Travel & Direct Expenses</i>	<i>\$15,120</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$10,080	
Equipment - Communications	\$202	2.0%
Equipment - Computing	\$202	2.0%
Equipment - Document Reproduction	\$202	2.0%
Equipment - General Office	\$202	2.0%
Equipment - Transportation	\$202	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%

Non-Residential Existing Facilities Program

Labor - Accounts Payable	\$101	1.0%
Labor - Accounts Receivable	\$101	1.0%
Labor - Administrative	\$101	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$101	1.0%
Labor - Contract Reporting	\$101	1.0%
Labor - Corporate Services	\$101	1.0%
Labor - Facilities Maintenance	\$101	1.0%
Labor - Information Technology	\$101	1.0%
Labor - Materials Management	\$101	1.0%
Labor - Procurement	\$101	1.0%
Labor - Regulatory Reporting	\$4,032	40.0%
Labor - Shop Services	\$101	1.0%
Labor - Telecommunications	\$101	1.0%
Labor - Transportation Services	\$101	1.0%
Office Supplies	\$101	1.0%
Postage	\$101	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$3,528	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$10,080</i>	<i>100.0%</i>
Total Administrative Costs	\$126,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$42,000	
Advertisements / Media Promotions	\$10,500	25.0%
Bill Inserts	\$1,680	4.0%
Brochures	\$2,520	6.0%
Door Hangers	\$0	0.0%

Non-Residential Existing Facilities Program

Labor - Business Outreach	\$2,100	5.0%
Labor - Customer Outreach	\$2,100	5.0%
Labor - Customer Relations	\$2,100	5.0%
Labor - Marketing	\$12,600	30.0%
Print Advertisements	\$6,300	15.0%
Radio Spots	\$2,100	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$42,000</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$42,000	
Subcontractor - Bill Inserts	\$2,100	5.0%
Subcontractor - Brochures	\$2,100	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$4,200	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$2,100	5.0%
Subcontractor Labor - Customer Outreach	\$2,100	5.0%
Subcontractor Labor - Customer Relations	\$2,100	5.0%
Subcontractor Labor - Marketing	\$2,100	5.0%
Television Spots	\$0	0.0%
Website Development	\$25,200	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$42,000</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$84,000	
Direct Implementation		
Financial Incentives to Customers	\$382,200	
Activity - Labor	\$18,200	
Labor - Curriculum Development	\$1,456	8.0%
Labor - Customer Education and Training	\$7,280	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$5,460	30.0%
Subcontractor Labor - Facilities Audits	\$1,820	10.0%
Subcontractor Labor - Curriculum Development	\$910	5.0%
Subcontractor Labor - Customer Education and Training	\$910	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$364	2.0%
<i>Subtotal Activity</i>	<i>\$18,200</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$9,100	
Audit Applications and Forms	\$728	8.0%
Direct Implementation Literature	\$1,820	20.0%
Education Materials	\$1,820	20.0%
Energy Measurement Tools	\$910	10.0%
Installation Hardware	\$910	10.0%
Subcontractor - Direct Implementation Literature	\$364	4.0%
Subcontractor - Education Materials	\$364	4.0%
Subcontractor - Energy Measurement Tools	\$1,456	16.0%
Subcontractor - Installation Hardware	\$546	6.0%
Subcontractor - Audit Applications and Forms	\$182	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$9,100</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$45,500	
Labor - Field Verification	\$4,550	10.0%

Non-Residential Existing Facilities Program

Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$4,550	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$4,550	10.0%
Subcontractor Labor - Field Verification	\$9,100	20.0%
Subcontractor Labor - Rebate Processing	\$13,650	30.0%
Subcontractor Labor - Site Inspections	\$9,100	20.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$45,500</i>	<i>100.0%</i>
Total Direct Implementation	\$455,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$33,250	
Labor - EM&V	\$1,663	5.0%
Materials - EM&V	\$1,663	5.0%
Subcontractor Labor - EM&V	\$29,925	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$33,250</i>	<i>100.0%</i>
EM&V Overhead	\$1,750	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$875	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$875	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$1,750</i>	<i>100.0%</i>
Total EM&V	\$35,000	
Total Budget	\$700,000	

Non-Residential Existing Facilities Program

Appendix 3 – Measure Level Energy Savings and Benefit/Cost Analysis

See accompanying Excel spreadsheet for program additional benefit/cost calculations

Technology portfolio weight and savings contribution

Measure Description	Portfolio weight	Target Units	Incremental Cost (\$)	Target Unit Definition	Non-Coin. Demand Savings (KW)	Coin. Demand Savings (KW)	Total Energy Savings (kWh)
Retrofit T12 Systems with T8 Systems and Electronic Ballasts	28.5%	9,691	\$35.85	Fixtures	363	338	1,548,150
Delamping	4.0%	1,019	\$59.92	Fixtures	95	89	406,480
Retrofit HID Systems with Linear Fluorescent T8 and T5 Systems	5.0%	156	\$231.06	Fixtures	43	40	182,981
Retrofit Incandescent to Integral Compact Fluorescent Lighting (CFL)	3.5%	7,644	\$7.94	Lamp	499	464	2,124,251
Cold Cathode CFL retrofit	4.0%	4,368	\$12.43	Lamp	194	194	1,239,534
Energy Efficient Exit Signs	2.0%	306	\$73.47	Sign	11	11	95,189
Occupancy Sensors on Lighting	3.0%	366	\$80.00	Connected kW	19	18	412,963
Daylighting Controls	2.0%	64	\$592.77	Connected kW	41	38	127,952
Energy Efficient Outdoor CFL Lighting	1.0%	2,184	\$9.08	Lamp	187	65	1,014,970
Anti-Sweat Heater Controls	2.0%	38	\$692.12	Case	35	30	183,080
High Efficiency Evaporator Fan Motors	0.5%	51	\$163.68	Motor	17	14	105,704
High Efficiency Reach-in Refrigerators and Freezers	0.5%	11	\$275.25	Unit	2	2	8,167
High Efficiency Ice Makers	0.5%	38	\$115.50	Unit	4	4	22,599
Strip Curtains and Night Covers	2.0%	1,019	\$27.63	Linear ft.	15	13	453,633
Occupancy Sensor Vending Machine and Reach-in Cooler Controls	1.0%	51	\$166.98	Unit	5	4	53,202
H210 - Energy Efficient Water Cooled Chiller	4.0%	355	\$118.92	Ton	52	49	84,034
H211 -- Energy Efficient Air Cooled Chillers	3.0%	419	\$95.00	Ton	54	51	68,711
Energy Efficient Packaged and Split Air Conditioners - SEER Rated	6.0%	90	\$425.61	Unit	29	28	64,329
Energy Efficient Packaged and Split Heat Pumps - SEER Rated	4.0%	60	\$522.44	Unit	20	19	69,769
Energy Efficient Packaged Air Conditioners - EER Rated	5.0%	20	\$2,176.60	Unit	44	42	81,100
Energy Efficient Heat Pumps - EER Rated	4.0%	19	\$2,482.30	Unit	38	36	86,343
Programmable Thermostats (Heating Setback / Cooling Setup)	0.5%	38	\$193.56	T-stat	0	0	129,126
Energy Efficient ODP Motors	1.0%	1,306	\$8.82	HP	14	13	77,364
Energy Efficient TEFC Motors	1.0%	1,304	\$17.00	HP	13	12	71,286
Variable Speed Drives	4.0%	306	\$269.73	HP	0	0	629,909
Variable-Speed Lubricant-Injected Rotary Screw Compressors	4.0%	306	\$262.44	Leak	31	28	275,661

Key benefit – cost metrics, by technology

Non-Residential Existing Facilities Program

Portfolio Weighting		Weighted PV of TRC Benefit (\$)	Weighted PV of Societal Benefit (\$)	Weighted Incremental Cost (\$)	Weighted PV Program Cost (\$)	Weighted Incremental Cost (\$)	Average Societal Cost Test
Retrofit T12 Systems with T8 Systems and Electronic Ballasts	Delamping	\$28.50	\$36.79	\$3.20	\$9.82	\$10.22	2.90
		\$12.84	\$16.57	\$0.60	\$2.66	\$2.40	4.83
Retrofit HID Systems with Linear Fluorescent T8 and T5 Systems		\$42.04	\$54.27	\$6.14	\$14.35	\$11.55	2.93
Retrofit Incandescent to Integral Compact Fluorescent Lighting (CFL)		\$0.98	\$1.02	\$0.06	\$0.22	\$0.28	4.48
Cold Cathode CFL retrofit		\$2.31	\$2.46	\$0.14	\$0.56	\$0.50	4.09
Energy Efficient Exit Signs		\$3.02	\$3.98	\$0.50	\$1.30	\$1.47	2.33
Occupancy Sensors on Lighting		\$16.29	\$19.66	\$0.94	\$2.94	\$2.40	5.54
Daylighting Controls		\$32.45	\$40.56	\$2.40	\$12.67	\$11.86	2.56
Energy Efficient Outdoor CFL Lighting		\$0.83	\$0.92	\$0.02	\$0.07	\$0.09	12.10
Anti-Sweat Heater Controls		\$56.18	\$67.80	\$4.00	\$15.78	\$13.84	3.56
High Efficiency Evaporator Fan Motors		\$6.69	\$8.36	\$0.19	\$0.89	\$0.82	7.49
High Efficiency Reach-in Refrigerators and Freezers		\$2.59	\$3.24	\$0.85	\$1.95	\$1.38	1.33
High Efficiency Ice Makers		\$1.73	\$2.09	\$0.25	\$0.73	\$0.58	2.38
Strip Curtains and Night Covers		\$1.91	\$2.06	\$0.15	\$0.62	\$0.55	3.06
Occupancy Sensor Vending Machine and Reach-in Cooler Controls		\$5.38	\$6.49	\$0.75	\$2.13	\$1.67	2.53
H210 - Energy Efficient Water Cooled Chiller		\$10.12	\$13.33	\$1.72	\$5.00	\$4.76	2.02
H211 -- Energy Efficient Air Cooled Chillers		\$6.05	\$7.96	\$0.82	\$2.82	\$2.85	2.14
Energy Efficient Packaged and Split Air Conditioners - SEER Rated		\$39.50	\$49.37	\$15.35	\$33.19	\$25.54	1.19
Energy Efficient Packaged and Split Heat Pumps - SEER Rated		\$35.95	\$44.94	\$10.23	\$25.23	\$20.90	1.43
Energy Efficient Packaged Air Conditioners - EER Rated		\$189.96	\$237.44	\$47.85	\$126.85	\$108.83	1.50
Energy Efficient Heat Pumps - EER Rated		\$155.67	\$194.58	\$32.55	\$106.50	\$99.29	1.46
Programmable Thermostats (Heating Setback / Cooling Setup)		\$3.95	\$4.70	\$0.25	\$0.69	\$0.97	5.70
Energy Efficient ODP Motors		\$0.40	\$0.50	\$0.03	\$0.10	\$0.09	3.89
Energy Efficient TEFC Motors		\$0.37	\$0.47	\$0.03	\$0.18	\$0.17	2.10
Variable Speed Drives		\$41.90	\$52.37	\$2.00	\$11.37	\$10.79	3.68
Variable-Speed Lubricant-Injected Rotary Screw Compressors		\$22.05	\$27.56	\$2.00	\$11.11	\$10.50	1.98

Non-Residential Existing Facilities Program

Calculation of customer rates

Rate	2006 kWh Sales	% of Sales	Summer		Winter	Ave	Summer		Winter		Weighted \$/kW	On Peak		Off Peak
			\$/kW	\$/kWh	\$/kW	\$/Kw	\$/kWh	\$/kWh	\$/kWh	\$/kWh		Weighted \$/kWh	Weighted \$/kWh	
Rt 13 Large General Service	1,203,620,147	55.2%	\$8.22	\$8.22	\$8.22	\$8.22	\$0.0637	\$0.0637	\$0.0606	\$0.0606	\$4.54	\$0.0352	\$0.0352	\$0.0334
Rt 14 Large Light & Power	606,793,402	27.8%	\$9.97	\$9.97	\$9.97	\$9.97	\$0.0460	\$0.0460	\$0.0437	\$0.0437	\$2.77	\$0.0128	\$0.0128	\$0.0122
Rt 85 TOU Large General Service	129,066,164	5.9%	\$7.50	\$4.96	\$4.96	\$6.23	\$0.0696	\$0.0617	\$0.0657	\$0.0578	\$0.37	\$0.0039	\$0.0039	\$0.0037
Rt 90 TOU Large Light & Power	241,783,000	11.1%	\$10.95	\$8.99	\$8.99	\$9.97	\$0.0588	\$0.0417	\$0.0588	\$0.0417	\$1.11	\$0.0056	\$0.0056	\$0.0056
Weighted Average Customer Cost											\$8.78	\$0.0574	\$0.0574	\$0.0548

Attachment 9

Attachment 9

Efficient Commercial Building Design Program

Efficient Commercial Building Design Program

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TEP Efficient Commercial Building Design Program

Program Concept and Description

The Efficient Commercial Building Design Program is a performance based program that includes design assistance for the design team, performance based incentives for the building owner/developer, and energy design information resources. Design assistance involves efforts to integrate energy-efficiency into a customer's design process to influence equipment/systems selection and specification as early in the design process as possible. Design assistance provides incentives to offset the additional design cost of investigating alternative energy efficient designs. The performance based incentives for the building owner/developer are based on improved efficiency compared to a baseline design and are computed by comparing the features of the baseline design to those of the energy efficient alternatives, using an hourly building energy simulation program such as DOE-2. Building energy analysis and modeling will most likely be provided by a pre-qualified design professional with expertise in building energy simulation modeling.

In addition to the design incentives and performance based incentives for the building owner/developer, this program will provide technical support services to the design community. The program provides consumer educational and promotional pieces designed to assist building owners/developers with the information necessary to understand various energy efficiency options, encourage them to explore energy efficiency options with their design professionals as early in the design process as possible, and improve the energy efficiency of their buildings. The program includes design professional outreach and education to assist with understanding how the design incentive works, what tools are available to support the design process, and how the program functions.

The viability of this performance based incentive has been assessed through a cost-effectiveness analysis according to the Total Resource Cost ("TRC"), Societal Cost ("SC") and Ratepayer Impact Measure ("RIM") tests by developing a prototypical building model and assessing the overall savings potential of design changes. The cost-effectiveness tests account for the energy and demand savings of each measure, the associated avoided costs and net benefits to TEP, the customer incremental or installed costs, and the program administration costs.

Appendix 1 provides a implementation process diagram.

Program Objectives

The primary goal of the program is to encourage more energy efficient new building design for new non-residential projects in TEP's service area. More specifically, the program is designed to:

- Provide incentives to building owners/developers to design and build more energy efficient buildings;
- Provide assistance to design teams to offset the additional cost and time of exploring more energy efficient design;;
- Overcome market barriers including:
 - Lack of awareness and knowledge about the benefits and cost of energy efficiency improvements;
 - Performance uncertainty associated with energy efficiency projects; and
 - Higher first costs for energy efficiency measures;

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- Assure that the participation process is clear and easy to understand and does not unduly burden the design/construction time schedule or budget process;
 - Increase the awareness and knowledge of building owners/developers, architects and engineers, and decision-makers on the benefits of high efficiency building design; and
 - Encourage building owners/developers and the design community to consider energy efficiency options as early in the design process as possible.
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Program Rationale

Certain barriers exist to the adoption of energy efficiency measures in the market, including (1) lack of investment capital and competition for funds with other capital improvements; (2) lack of awareness/knowledge about the benefits and costs of energy efficiency measures; (3) high transaction and information search costs; and (4) technology performance uncertainties. This program is designed to help overcome these market barriers and encourage greater adoption of energy efficiency measures in new commercial building construction. In addition, new construction projects are often time and budget constrained limiting the ability of building owners/developers and their design professionals to explore alternative energy efficient design concepts.

In addition to helping customers reduce and manage their energy costs, this program provides other societal and customer benefits including reduced greenhouse gas emissions, improved levels of service from energy expenditures, and lower overall rates and energy costs compared to other resource options.

Target Market and Eligibility Requirements

All new commercial building projects and major renovations to existing buildings in the TEP service region that will or do receive electric service from TEP are eligible to participate in the program.

Estimate of Baseline Conditions

TEP has not conducted a formal baseline study of new commercial construction design characteristics. However, in preparing the analysis for this plan, the baseline performance conditions of new commercial construction projects were estimated based on best available knowledge of current market conditions and design practices. In order to substantiate the baseline assumptions made in the preparation of this plan, TEP is proposing to conduct a formal baseline study but funding for the baseline study will be requested in a separate docket from this Program Plan.

Products and Services Provided

The Efficient Commercial Building Design Program is designed to encourage the design of more energy efficient new buildings by influencing the design of the building as early in the design development process as possible when there are typically more options to influence the energy performance of the building. It is also designed to promote a more holistic or whole building approach to energy efficiency building design. To accomplish this, the program offers incentives to the design team to cover the incremental effort involved in investigating alternative designs and to the building owner/developer to help cover the incremental cost of installing more energy efficient building systems.

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The program offers the following products and services. Incentives are summarized in Table 1.

- **Building Performance Incentives** will be offered to building owners/developers for improving the energy efficiency of their buildings of \$0.10 per kWh of annual energy saved for one year. This value will be computed on the basis of a comparison between a baseline building design and the selected energy efficient alternative. Building design energy performance will be estimated with an hourly building energy simulation program such as DOE-2. The energy analysis will be conducted by a qualified energy professional with expertise in building energy simulation modeling. The incentive amount will be capped at \$300,000 per customer and / or 50% of the incremental cost.
- **Design Assistance Incentives** will be offered to the design team to offset the additional effort required of design professionals to examine alternative energy efficient designs of \$0.05 per kWh of annual energy saved. Design incentives are paid directly to the design professionals, are capped at \$10,000 per project, and are in addition to the Building Performance Incentives.
- In addition to the design incentives and performance based incentives for the building owner/developer this program will provide technical support services to the design community.
- The program will provide consumer educational and promotional pieces designed to assist building owners/developers with the information necessary to understand various energy efficiency options, encourage them to explore energy efficiency options with their design professionals as early in the design process as possible, and improve the energy efficiency of their buildings.
- The program includes design professional outreach and education to assist them with understanding how the design incentive works, what tools are available to support the design process, and how the program functions.

Table 1. Efficient Commercial Building Design Incentive Summary

Incentive	Amount	Limitations
Building Performance Incentive for Building Owners/Developers	\$0.10 per annual kWh saved	<ul style="list-style-type: none">▪ Incentives cannot exceed 50% of the incremental cost▪ Incentives paid to a single customer cannot exceed \$300,000 per customer
Design Assistance Incentive	\$0.05 per annual kWh saved	<ul style="list-style-type: none">▪ Incentives paid directly to design team and are in addition to owner incentives▪ Up to \$10,000 per project

Delivery Strategy and Administration

The Efficient Commercial Building Design Program is a performance based efficiency program and will most likely be managed by an in-house program manager. The TEP program manager will provide (1) a source of guidance on the program; (2) training on program activities and technical assistance for design professionals; (3) an important contact point for customers who are interested in or have concerns about the program; and (4) overall quality control and management of the delivery process.

TEP will provide program administration, marketing, application and incentive processing, participation tracking and reporting, project quality control, and technical support. TEP will conduct outreach and provide training on the benefits and function of the program to the design community, potential project

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developers, the commercial building ownership and management community, and professional real estate organizations such as BOMA.

Marketing and Communications

The marketing and communications strategy will be designed to inform building owners/developers, key customer groups involved in new construction activities (e.g., school systems), and design professionals of the availability and benefits of the program and how they can participate in the program. An important part of the marketing plan will be the content and functionality on the TEP website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars about how to participate in the Program. The seminars will be tailored to building owners, potential project developers, key customer groups involved in new construction activities (e.g., school systems), and architects and engineers.
- A combination of marketing strategies including media advertising, outreach and presentations at professional and community forums and events, and direct outreach to building owners/developers and design professionals. Marketing activities will include:
 - **Brochures** will be prepared that describe the benefits and features of the program including program application forms and worksheets. The brochures will be mailed upon demand and distributed through the call center and TEP.com and will be available for various public awareness events;
 - **Targeted mailing** will be used to educate customers on the benefits of the program and explain how they can apply;
 - **Customer and trade partner outreach and presentations** (e.g., school associations, BOMA, ASHRAE) informing interested parties about the benefits of the program and how to participate;
 - **Print advertisements** to promote the program will be placed in selected local media including Tucson area newspapers and trade publications;
 - **Website content at TEP.com** will provide program information resources, contact information, downloadable application forms and worksheets, and links to other relevant service and information resources;
 - **TEP Account Executives** and Program Managers will be trained to answer any customer questions regarding the program;
 - **Presence at conferences and public events** will be used to increase general awareness of the program and distribute program promotional materials; and
 - **Presentations by the Program Manager** to key customers and customer groups will actively solicit their participation in the program.
- The marketing strategy will identify key customer segments and groups for target marketing including the University of Arizona, school districts, Ft. Huachuca and Davis-Monthan Air Force Base and prepare specific outreach activities for these customers.
- TEP will design and develop the content, messaging, branding, for all marketing and collateral materials used to promote the program.

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- The TEP Program Manager will be responsible for program promotion including customer contact, attendance at public presentations and events, and will be the primary contact point from the website and other promotional materials.

Program Implementation Schedule

The program implementation schedule is summarized in Table 2.

Table 2. Efficient Commercial Building Design Program Implementation Schedule

Program Activities	2007				2008				2009			
New program submitted to ACC for approval												
New program approval (estimated)												
Marketing and communications plan prepared (including collateral materials)												
Implementation plan prepared												
Program implementation and delivery												
MER impact and cost-effectiveness analysis												
MER process evaluation												
Progress reporting to ACC												
Program redesign as needed												

Estimated Participation and Demand and Energy Savings

Total annual participation goals and demand and energy savings are presented in Table 3. The program expects that, on average, 14 buildings annually will participate in the program. Additional details on the energy savings analysis and benefit cost analysis are included in Appendix 3.

Table 3. Efficient Commercial Building Design Program Annual Energy Savings

Year	2008	2009	2010	2011	2012
Average Projected Number of Participating Facilities	13	13	14	14	15
Non-coincident peak (kW)	658	677	698	719	740
Coincident peak (kW)	658	677	698	719	740
Energy Savings (kWh)	3,029,333	3,120,213	3,213,820	3,310,234	3,409,541

In addition to the savings shown above, it is estimated that the program will produce the additional benefits from 2008 – 2012 presented in Table 4.

Table 4. Projected Environmental Benefits, 2008 - 2012

Water Savings	8,041,571	Gallons
SOx	38,439	Lbs
NOx	63,850	Lbs
CO2	33,581,601	Lbs

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Program Cost Effectiveness

Table 5 provides a summary of the benefit/cost analysis results for this program. A detailed benefit/cost analysis is presented in Appendix 3.

Table 5. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	SC	RIM
Benefit/Cost Ratio	1.62	2.05	1.08

Additional financial assumptions are provided in Table 6.

Table 6. Other Financial Assumptions

Average Conservation Life (yrs):	16.3
Program Life (yrs):	5
Demand AC (\$/kW):	128.24
Summer Energy AC (\$/kWh):	0.07314
Winter Energy AC (\$/kWh):	0.05306
Ratio of Non-inc to Incentive Costs	76.1%
IRP Discount Rate	8.50%
Social Discount Rate	5.00%
NTG Ratio:	83.5%

Budget

The annual budget of approximately \$800,000 will be allocated as shown in Table 7, while Table 8 provides the expected program budgets through 2012. Appendix 2 provides additional details on the 2008 budget.

Table 7. 2008 Efficient Commercial Building Design Program Budget

Total Program Budget	\$800,000
Total Administrative Cost Allocation	
Managerial & Clerical	\$96,784
Travel & Direct Expenses	\$2,351
Overhead	\$35,843
Total Administrative Cost	\$134,977
Total Marketing Allocation	
Internal Marketing Expense	\$32,000
Subcontracted Marketing Expense	\$32,000
Total Marketing Cost	\$64,000
Total Direct Implementation	
Financial Incentives	\$454,400
Support Activity Labor	\$22,720
Hardware & Materials	\$5,680
Rebate Processing & Inspection	\$85,200
Total Direct Installation Cost	\$568,000

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Total EM&V Cost Allocation	
EM&V Activity	\$13,443
EM&V Overhead	\$10,557
Total EM&V Cost	\$24,000

Table 8. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total budget	\$800,000	\$824,000	\$848,720	\$874,182	\$900,407
Incentives	\$454,400	\$468,032	\$482,073	\$496,535	\$511,431
Administrative Costs	\$345,600	\$355,968	\$366,647	\$377,646	\$388,976
Incentives as % of budget	56.8%	56.8%	56.8%	56.8%	56.8%

Measurement, Evaluation and Research

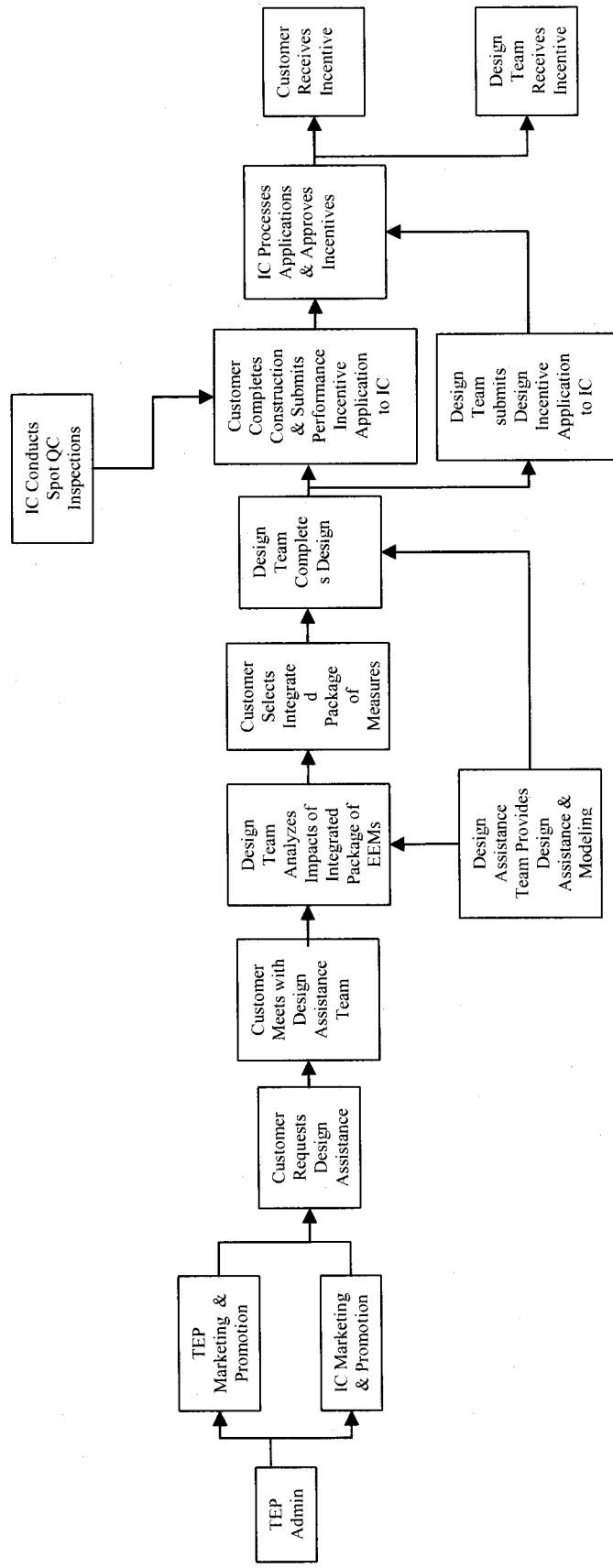
TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities

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Appendix 1 – Efficiency Commercial Building Design Implementation Process



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Appendix 2 – Program Costs

2008 Program Costs Details

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$96,784	
Labor - Clerical	\$4,839	5.0%
Labor - Program Design	\$4,839	5.0%
Labor - Program Development	\$4,839	5.0%
Labor - Program Planning	\$14,518	15.0%
Labor - Program/Project Management	\$9,678	10.0%
Labor - Staff Management	\$9,678	10.0%
Labor - Staff Supervision	\$4,839	5.0%
Subcontractor Labor - Clerical	\$4,839	5.0%
Subcontractor Labor - Program Design	\$9,678	10.0%
Subcontractor Labor - Program Development	\$4,839	5.0%
Subcontractor Labor - Program Planning	\$4,839	5.0%
Subcontractor Labor - Program/Project Management	\$19,357	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$96,784</i>	<i>100.0%</i>
Travel and Conference Fees	\$11,374	
Conference Fees	\$3,412	30.0%
Labor - Conference Attendance	\$2,275	20.0%
Subcontractor - Conference Fees	\$227	2.0%
Subcontractor - Travel - Airfare	\$455	4.0%
Subcontractor - Travel - Lodging	\$0	0.0%
Subcontractor - Travel - Meals	\$0	0.0%
Subcontractor - Travel - Mileage	\$0	0.0%
Subcontractor - Travel - Parking	\$0	0.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$910	8.0%
Subcontractor Labor - Conference Attendance	\$227	2.0%
Travel - Airfare	\$1,592	14.0%
Travel - Lodging	\$682	6.0%
Travel - Meals	\$341	3.0%
Travel - Mileage	\$114	1.0%
Travel - Parking	\$0	0.0%
Travel - Per Diem for Misc. Expenses	\$1,137	10.0%

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Budget Items	Budget	Allocation Rate (%)
<i>Subtotal Travel and Conference Fees</i>	<i>\$11,374</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$35,843	
Equipment - Communications	\$717	2.0%
Equipment - Computing	\$717	2.0%
Equipment - Document Reproduction	\$717	2.0%
Equipment - General Office	\$717	2.0%
Equipment - Transportation	\$717	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$358	1.0%
Labor - Accounts Receivable	\$358	1.0%
Labor - Administrative	\$358	1.0%
Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$358	1.0%
Labor - Contract Reporting	\$358	1.0%
Labor - Corporate Services	\$358	1.0%
Labor - Facilities Maintenance	\$358	1.0%
Labor - Information Technology	\$358	1.0%
Labor - Materials Management	\$358	1.0%
Labor - Procurement	\$358	1.0%
Labor - Regulatory Reporting	\$14,337	40.0%
Labor - Shop Services	\$358	1.0%
Labor - Telecommunications	\$358	1.0%
Labor - Transportation Services	\$358	1.0%
Office Supplies	\$358	1.0%
Postage	\$358	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%

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Budget Items	Budget	Allocation Rate (%)
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$12,545	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$35,843</i>	<i>100.0%</i>
Total Administrative Costs	\$144,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$32,000	
Advertisements / Media Promotions	\$8,000	25.0%
Bill Inserts	\$1,280	4.0%
Brochures	\$1,920	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$1,600	5.0%
Labor - Customer Outreach	\$1,600	5.0%
Labor - Customer Relations	\$1,600	5.0%
Labor - Marketing	\$9,600	30.0%
Print Advertisements	\$4,800	15.0%
Radio Spots	\$1,600	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$32,000</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$32,000	
Subcontractor - Bill Inserts	\$1,600	5.0%
Subcontractor - Brochures	\$1,600	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$3,200	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$1,600	5.0%
Subcontractor Labor - Customer Outreach	\$1,600	5.0%
Subcontractor Labor - Customer Relations	\$1,600	5.0%
Subcontractor Labor - Marketing	\$1,600	5.0%
Television Spots	\$0	0.0%

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Budget Items	Budget	Allocation Rate (%)
Website Development	\$19,200	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$32,000</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$64,000	
Direct Implementation		
Financial Incentives to Customers	\$454,400	
Activity - Labor	\$22,720	
Labor - Curriculum Development	\$1,818	8.0%
Labor - Customer Education and Training	\$9,088	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$6,816	30.0%
Subcontractor Labor - Facilities Audits	\$2,272	10.0%
Subcontractor Labor - Curriculum Development	\$1,136	5.0%
Subcontractor Labor - Customer Education and Training	\$1,136	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$454	2.0%
<i>Subtotal Activity</i>	<i>\$22,720</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$5,680	
Audit Applications and Forms	\$454	8.0%
Direct Implementation Literature	\$1,136	20.0%
Education Materials	\$1,136	20.0%
Energy Measurement Tools	\$568	10.0%
Installation Hardware	\$568	10.0%
Subcontractor - Direct Implementation Literature	\$227	4.0%
Subcontractor - Education Materials	\$227	4.0%
Subcontractor - Energy Measurement Tools	\$909	16.0%
Subcontractor - Installation Hardware	\$341	6.0%
Subcontractor - Audit Applications and Forms	\$114	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$5,680</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$85,200	
Labor - Field Verification	\$8,520	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$8,520	10.0%
Rebate Applications	\$0	0.0%
Subcontractor - Rebate Applications	\$8,520	10.0%
Subcontractor Labor - Field Verification	\$17,040	20.0%
Subcontractor Labor - Rebate Processing	\$25,560	30.0%
Subcontractor Labor - Site Inspections	\$17,040	20.0%

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Budget Items	Budget	Allocation Rate (%)
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$85,200</i>	<i>100.0%</i>
Total Direct Implementation	\$568,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	<i>\$13,443</i>	
Labor - EM&V	\$672	5.0%
Materials - EM&V	\$672	5.0%
Subcontractor Labor - EM&V	\$12,099	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$13,443</i>	<i>100.0%</i>
EM&V Overhead	<i>\$10,557</i>	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$5,278	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$5,278	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$10,557</i>	<i>100.0%</i>
Total EM&V	\$24,000	
Total Budget	\$800,000	

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Appendix 3 – Measure Level Energy Savings and Benefit Cost Calculations

DEMAND/ENERGY SAVINGS									
Building Type	Sq.Ft. Range	Baseline Demand		Baseline Energy Use		Baseline Energy Use		Non-Coincident Demand Savings	
		(W/sf)	(KW)	(KW/sf)	(KWh)	(KWh)	(KWh)	(KW)	(KWh)
Office (<100,000 sf)	50000-99999	2.16	162.00	4.00	300,000	24.30	47250	27750	27750
Office (>100,000 sf)	100000-450000	2.05	736.51	5.31	1,907,750	110.48	300471	176467	176467
Retail	75000-200000	1.82	213.62	3.76	441,334	32.04	69510	40823	40823
Health Care	175000-30000	2.28	554.25	7.16	1,740,553	83.14	274137	161001	161001
Hotel/Resort	113567	1.39	157.86	6.96	790,426	23.68	124492	73114	73114
Grocery	25000-50000	1.88	69.39	5.65	208,536	10.41	32844	19290	19290
School	50000-225000	0.91	148.42	3.58	583,912	22.26	91966	54012	54012
Weighted Average		1.87	339.66	5.02	938,760	50.95	147855	86835	86835

DEMAND/ENERGY SAVINGS		INCENTIVE CALCULATIONS						CUSTOMER COST/SAVINGS			
Building Type	Sq.Ft. Range	Building Type	IRP PV Benefit		Social PV Benefit		PV Program Cost	NPV	Incr. Cost	Cost Savings	Payback
			(\$)	(\$)	(\$)	(\$)					
Office (<100,000 sf)	50000-99999	Office (<100,000 sf)	60738	77012	11250	19%	39088	21649	36563	7845	4.7
Office (>100,000 sf)	100000-450000	Office (>100,000 sf)	343152	435098	71541	21%	181169	161983	151794	47812	3.2
Retail	75000-200000	Retail	85729	108699	16550	19%	53999	31729	49591	11366	4.4
Health Care	175000-30000	Health Care	295807	375067	65271	22%	214580	81227	197514	42791	4.6
Hotel/Resort	75000-150000	Hotel/Resort	120564	152868	29641	25%	74941	45623	62746	18770	3.3
Grocery	25000-50000	Grocery	35878	45492	7820	22%	22977	12902	20392	5148	4.0
School	50000-225000	School	93732	118847	21897	23%	65346	28385	58310	14091	4.1
Weighted Average			165518	209868	35204	21%	102216	63302	90342	23367	4.08

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DEMAND/ENERGY SAVINGS		WGT.	% Incent	BC Ratio	BC Ratio
Building Type	Sq.Ft. Range	Weighting Factor	(%)	TRC	Societal
Office (<100,000 sf)	50000-99999	0.20	31%	1.55	1.97
Office (>100,000 sf)	100000-450000	0.20	47%	1.89	2.40
Retail	75000-200000	0.20	33%	1.59	2.01
Health Care	175000-30000	0.15	33%	1.38	1.75
Hotel/Resort	75000-150000	0.10	47%	1.61	2.04
Grocery	25000-50000	0.05	38%	1.56	1.98
School	50000-225000	0.10	38%	1.43	1.82
Weighted Average		1.00	39%	1.62	2.05

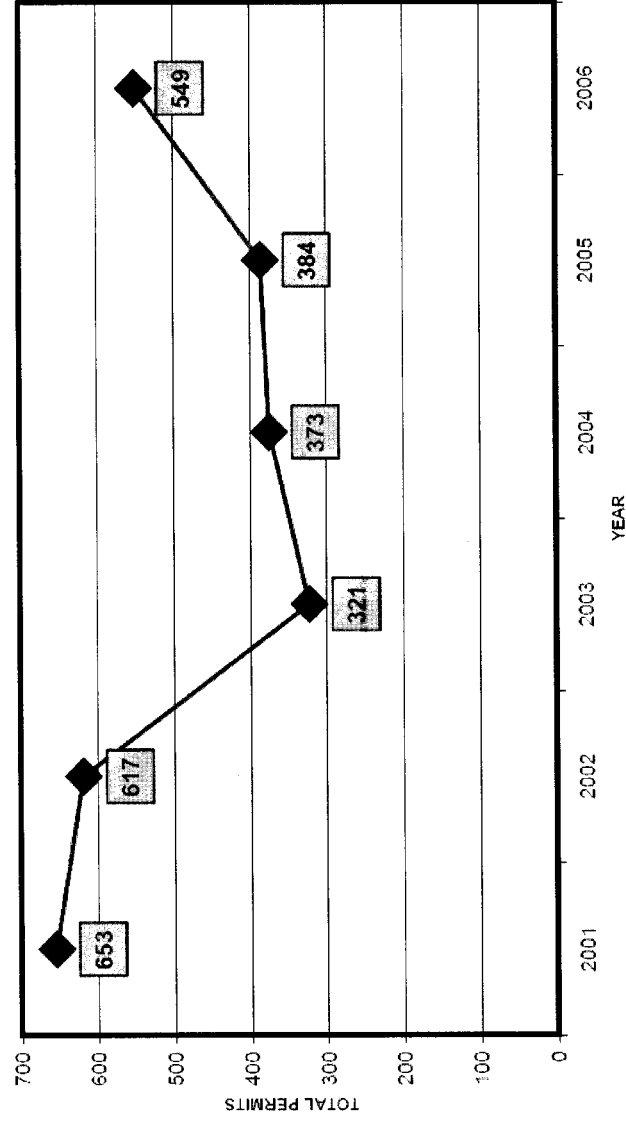
Incremental Cost Data

Bldg	Size Range (SqFt)	SqFt	Base Construction Cost (\$/SqFt)	Construction Cost (\$)	Adjusted EE Incremental Cost Factor	Incremental Cost (\$)
Office (<100,000 sf)	50000-99999	75,000	75	5,625,000	0.65%	36,563
Office (>100,000 sf)	100000-450000	359,275	65	23,352,875	0.65%	151,794
Retail	75000-200000	117,376	65	7,629,440	0.65%	49,591
Health Care	175000-30000	243,094	125	30,386,750	0.65%	197,514
Hotel/Resort	75000-150000	113,567	85	9,653,195	0.65%	62,746
Grocery	25000-50000	36,909	85	3,137,265	0.65%	20,392
School	50000-225000	163,104	55	8,970,720	0.65%	58,310

Efficient Commercial Building Design Program

TEP Commercial Permit History

COMMERCIAL, INDUSTRIAL & MULTIFAMILY BUILDING PERMITS ISSUED
TUCSON METROPOLITAN AREA
2001-2006



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A Product of Bright Future Business Consulting, 530-761-0676

Forecast of TEP participants

Ave TEP permits	433
% greater than 25,000 sq ft	9.7%
TEP Territory %	77.0%
CNC Program %	45.0%
CNC Target Parts	14.51

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Attachment 10

Small Business Program

Attachment 10

Small Business Program

Small Business Program

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TEP Small business Program

Program Concept and Description

DSM incentive programs have typically had limited success reaching small business participants. This market segment generally has limited access to investment capital, little or no knowledge of energy cost savings opportunities, and requires a simple payback of one year or less before they will participate. In order to successfully reach this market segment and encourage small businesses to participate, the company proposes to offer a direct installation program with the features described below. The proposed program will focus on reducing known barriers in this market and provide the incentives and delivery mechanisms to encourage participation in the program.

- In order to minimize the hassle factor for customers and encourage the market to provide energy efficiency services to the small business market segment, the program will be operated as an “up-stream” market program and offer incentives directly to installing contractors. In order to stimulate the market, incentives will be offered which are intended to reduce the measure payback to one year or less, cover from 75% to 100% of the installed cost of the measure, and provide a TRC cost effectiveness of one or more.
- Eligible customers for the Small Business Program are customers who qualify for TEP’s pricing plan, Rate 10 – Small General Service, (typically an aggregate monthly demand of 200 kW or less). This criteria allows the program to focus resources on those customers with the greatest barriers to participation. Customers on other commercial pricing plans (typically with demands greater than 200 kW) are not eligible for this program but can participate in other TEP programs.
- The program will offer incentives for a select group of retrofit (RET) and replace-on-burnout (ROB) energy efficiency measures in existing facilities. The efficiency measures offered by the Small Business Program include high-efficiency lighting equipment upgrades, high-efficiency HVAC equipment, lighting controls, programmable thermostats, and selected refrigeration measures.
- The direct install component will utilize an on-line proposal generation and project tracking application to reduce the transaction costs of the contractor which will result in lower costs for the participants.

The viability of each of the measures has been assessed through a cost-effectiveness analysis according to the Total Resource Cost (“TRC”) and Ratepayer Impact Measure (“RIM”) and Societal Cost (“SC”) tests. The cost-effectiveness tests account for the energy and demand savings of each measure, the associated avoided costs and net benefits to TEP, the customer incremental or installed costs, and the program administration costs. The custom measure is designed so that each project that is approved must meet the TRC test.

The program includes consumer educational and promotional pieces designed to assist business owners, building operators and decision makers in the small business market with the information necessary to improve the energy efficiency of the lighting, HVAC and refrigeration systems in their facilities. The program includes customer and trade ally education to help them with understanding of the technologies being promoted, what incentives are offered, and how the program functions.

Appendix 3 provides a program logic diagram.

Small Business Program

Program Objectives

The primary goal of the program is to encourage TEP's small business customers to install energy efficiency measures in existing facilities. More specifically, the program is designed to:

- Encourage small business customers to install high-efficiency lighting equipment and controls, HVAC equipment, and energy-efficient refrigeration system retrofits in their facilities (see Table 1 for the schedule of measures and incentives).
 - Encourage contractors to promote the program and provide turn-key installation services to small business customers.
 - Overcome the unique market barriers of the small business market including:
 - First costs and lack of access to capital for energy efficiency improvements
 - Lack of awareness and knowledge about the benefits and cost of energy efficiency improvements,
 - Hassle and transaction costs
 - Performance uncertainty associated with energy efficiency projects, and
 - Assure that the participation process is clear, easy to understand and simple.
 - Increase the awareness and knowledge of business owners, building owners and managers, and other decision-makers on the benefits of high-efficiency equipment and systems.
-

Program Rationale

Program participation by small business customers has typically been very low in DSM programs even with targeted marketing efforts. As a result, utilities across the country have begun to design innovative programs specifically formulated to penetrate this market segment. At the same time, there are significant energy efficiency opportunities in small commercial customer facilities. However, several significant market barriers are typically encountered in this market. These barriers need to be addressed in the program design with initiatives included to overcome these barriers. Key market barriers among small commercial customers include capital cost and lack of access to capital, lack of awareness of energy efficiency opportunities, project lead time and the "hassle" factor.

Successful programs across the country have employed a combination of features to reach this market and result in energy savings including covering up to 100% of installed cost, providing financing for costs not covered by incentives, offering free energy audits, and engaging the contractor community to provide turn-key services. Small businesses lack the capital, expertise and staff necessary to analyze and act on energy-efficiency opportunities. The proposed small business program will minimize these barriers effectively by lowering the first cost, minimizing customer hassle and transaction costs, and reducing risks associated with equipment performance and contractor reliability.

Programs must take an innovative approach to providing energy efficiency services to the hard-to-reach small commercial market segment. The direct install program concept has a proven track record of high participation rate and cost-effective life cycle savings for hard-to-reach markets. The challenge of this approach has been to successfully balance marketing and administrative costs with incentive levels in order to maximize cost effectiveness. The proposed program design minimizes marketing and transaction costs while maximizing penetration, and therefore, cost-effectiveness.

The most cost-effective approach to any program is highly dependent upon the characteristics of the target market for which savings are desired. For certain markets, approaches that involve high levels of

Small Business Program

effective information dissemination and moderate incentives provide the most cost effective solution. Recent utility experience in delivering and evaluating commercial programs indicates that this is not the case for small and very small businesses, especially those in economically depressed areas. The historical evidence demonstrates clearly that very small commercial customers will not adopt efficiency measures or participate in efficiency programs at meaningful levels without a combination of high incentive levels and complete turnkey services.

Target Market and Eligibility Requirements

All commercial customers who qualify for TEP's pricing plan, Rate 10 – Small General Service, (typically an aggregate monthly demand of 200 kW or less). Customers must be in the TEP service region, receive electric service from TEP and have a monthly demand of 200 kW or less to be eligible to participate in the program. Systems or equipment being replaced on burnout (ROB) or prior to failure (retrofit) are all eligible for the program.

The application designation is important because it helps to define what type of cost estimate is needed by identifying the types of projects where the measure is expected to be applied. There are three application codes that have been used:

- **Retrofit (RET)** – Replacing a working system with a new technology before the end of its useful life, or installing a technology that was not there before. The cost basis for this application is typically installed cost;
 - **Replace-on-burnout (ROB)** – Replacing a technology at the end of its useful life. The cost basis for this application is typically the incremental cost of a more efficient technology compared to a less efficient baseline technology and
-

Estimate of Baseline Conditions

TEP has not conducted a formal baseline study of the existing small commercial market. However, the experience of other utilities and research conducted elsewhere around the country confirms that the small business market is an under served market, and that significant savings opportunities exist. In preparing the analysis of each of the measures included in this plan, the baseline performance conditions of each technology were estimated based on best available knowledge of current market conditions and technology applications. Resources used for the estimation of both baseline and energy efficiency technology performance and cost included (i) the California DEER database; (ii) detailed engineering modeling and simulation specific to the desert southwest climate; (iii) data from recognized industry resources such as the CEE and ASHRAE; (iv) manufacturers data; and (v) data accumulated from similar analysis for other regional utilities. In order to substantiate the baseline assumptions made in the preparation of this plan, TEP is proposing to conduct a formal baseline study but funding for the baseline study will be requested in a separate docket from this Program Plan.

Products and Services Provided

The Small Business Program is an upstream market incentive program design that provides incentives directly to installing contractors for the installation of energy efficiency measures in existing non-

Small Business Program

residential facilities with a monthly demand of 200 kW or less. More specifically, the program offers the following products and services:

- Consumer educational and promotional pieces designed to assist contractors with marketing the program and business/facility operators with the information necessary to make decisions regarding improving the energy efficiency of lighting, HVAC and refrigeration systems;
- Education and promotional efforts for customers and contractors on how the program functions, what energy efficiency technologies are offered, what incentives are provided and the benefits of the measures;
- Measures and up stream incentives provided to the installing contractor are included in the tables below; and
- Internet enabled efficiency measure analysis, proposal preparation and project tracking

The Small Business program will be an upstream market program providing incentives directly to contractors for the installation of selected high efficiency lighting, HVAC and refrigeration measures. The incentives will be set at a higher level for this market in order to incent contractors to sell and deliver the program thus offsetting the need for TEP marketing and overhead expenses. In order to further reduce overhead expenses, the program may employ internet measure analysis and customer proposal processing which will make the process easy for both contractors and customers. The program design is meant to minimize common barriers to implementation of energy efficiency improvements in this market, including lack of capital, hassle factor, information search costs, transaction costs and performance uncertainty. The measures to be included in the program are:

Lighting Measures:

- T8 lighting retrofits – retrofit of T12 fluorescent lighting with T8 lighting.
- Screw-in CFL retrofits – replacement of incandescent lamps with screw-in fluorescent lamps.
- Exit sign retrofits – retrofit of incandescent and CFL exit signs with LED or electroluminescent exit signs lighting.
- Occupancy sensors – installation of occupancy sensor controls on lighting systems.
- De-lamping – de-lamping of fluorescent lighting fixtures.

HVAC Measures:

- High-efficiency AC/HP – Installation of high-efficiency packaged air conditioners and heat pumps.
- Programmable thermostats – Replacement of standard thermostats with programmable set-back thermostats.

Refrigeration Measures:

- Integrated refrigerated case controls and motor retrofits -- Retrofitting refrigerated cases in small commercial facilities with control systems and other measures that reduce case energy use. The integrated package includes fan and anti-sweat heater controls, replacing fans with high efficiency models, and other component controls.
- Refrigerated case evaporator fan controls – Installation of refrigerated case evaporator fan controls.
- Anti-sweat heater controls – Installation of refrigerated case anti-sweat heater controls.
- Refrigerated case fan motor retrofit – Retrofit of refrigerated case fan motors with high-efficiency motors.

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Table 1 presents a summary of the average incentives to be offered for each of the Small Business Program measures. Unless otherwise noted in the table, these are average expected incentives for the measures to be installed based on expected market participation. Specific incentive levels for certain items where a variety of configurations are possible, such as lighting, can be found in the measure analysis worksheets.

Table 1: Small Business Incentive Summary

LIGHTING MEASURES	Incentive per Unit	Target Unit Definition
Replace T12 Systems & Magnetic Ballasts w T8 Systems & Electronic Ballasts	\$35	Per Fixture
Energy Efficient Integral Compact Fluorescent Lighting (CFL)	\$7	Per Lamp
Replace Incandescent and CFL Exit Signs	\$60	Per Fixture
Delamping and Replace 4-lamp T12 Systems with T8 Systems	\$45	Per Fixture
Install Occupancy Sensors on Lighting Fixtures	\$65	Per Connected kW
HVAC MEASURES		
Programmable Thermostats	\$150	Per Thermostat
High-Efficiency Packaged AC and Heat Pumps (<65,000 Btuh)	\$125 - \$675	Per unit, depending on Size and SEER Rating
REFRIGERATION MEASURES		
Integrated Refrigerated Case Control and Motor Retrofit	Up to \$6,200	Incentive depends on scope of integrated retrofit and blend of measures installed
Refrigerated Case Evaporator Fan Controls	Up to \$2,500	Incentive depends on scope control retrofit
Anti-sweat Heater Controls	Up to \$1,350.00	Incentive depends on scope control retrofit
Evaporator Fan Motor Retrofit	\$140	Motor

Program Delivery Strategy

The Small Business Program is an upstream market incentive program that will utilize contractors to provide turn-key installation services to customers. Installing contractors will be pre-qualified for providing program services. Qualification requirements will include meeting minimum business performance standards as defined by the Arizona Registrar of Contractors and completing a TEP sponsored program orientation and training program. Incentives will be paid directly to contractors and

Small Business Program

are designed to offset up to 100% of project installation costs. The participation process may be facilitated by an internet-based system that will provide an analysis of project savings, cost and cost savings and automated proposal preparation.

TEP will assign an in-house program manager to oversee the program, provide guidance on program activities that is consistent with TEP's goals and customer service requirements, and provide a contact point for customers who are interested in or have concerns about the program. The program manager will be responsible for program administration, application and incentive processing, monitoring the activities of the installing contractors, participation tracking and reporting, and overall quality control and management of the delivery process. As part of the implementation plan, TEP will conduct outreach to contractors, marketing and promotion to target customer groups, and education and training on the benefits and functioning of the program.

The installing contractors will promote the program directly to customers, provide turn-key installation services and have access to the internet processing system to prepare proposals for customers.

Program Marketing and Communications Strategy

The marketing and communications strategy will be designed to inform customers of the availability and benefits of the program and how they can participate in the program. The strategy will include outreach to installing contractors and other parties of interest in the market. An important part of the marketing plan will be content and functionality on the TEP website, which will direct customers to information about the program. More specifically, the marketing and communications plan will include:

- Education seminars targeted at the small business market to provide details about how to participate in the Program. The seminars will be tailored to the needs of small business owners, building managers, vendors, and electrical, mechanical and refrigeration contractors;
- A combination of strategies including major media advertising, outreach and presentations at professional and community forums and through direct outreach to customers with monthly demands of 200 kW or less. Marketing activities may include:
 - Brochures that describe the benefits and features of the program. The brochures will be mailed upon demand and distributed through the call center and TEP.com and will be available for various public awareness events;
 - Targeted mailing used to educate customers on the benefits of the program and explain how they can participate through pre-qualified installing contractors;
 - Customer and trade partner outreach and presentations informing interested parties about the benefits of the program and how to participate;
 - Print advertisements to promote the program placed in selected local media including the Tucson area newspapers and trade publications;
 - Website content at TEP.com providing program information resources, contact information, and links to other relevant service and information resources;
 - Pre-qualified installing contractors will have access to the program implementation website where they can analyze projects and prepare proposals for customers;
 - TEP customer care representatives trained to answer any customer questions regarding the program;
 - Presence at conferences and public events used to increase general awareness of the program and distribute program promotional materials; and

Small Business Program

- Presentations by the program manager to contractor and customer groups to actively solicit their participation in the program.
- TEP will design and develop the content, messaging, branding, and calls to action of all of the marketing and collateral materials used to promote the program;
- The implementation contractor will be responsible for assisting with program promotion including customer contact, attendance at public presentations and events, and be the primary contact point from the website and other promotional materials.

Program Implementation Schedule

The program implementation schedule is summarized in Table 2.

Table 2. Small Business Program Implementation Schedule

Program Activities	2007			2008			2009		
New program submitted to ACC for approval									
New program approval (estimated)									
Implementation contractor RFPs issued									
Implementation contractors selected									
Marketing and communications plan prepared (including collateral materials)									
Implementation plan prepared									
Program kick-off and marketing campaign launched									
Program implementation and delivery									
MER impact and cost-effectiveness analysis									
MER process evaluation									
Progress reporting to ACC									
Program redesign as needed									

Estimated Participation and Demand and Energy Savings

Total annual demand and energy savings goals are presented in Table 3. In addition to the savings shown below, it is estimated that the program will produce the additional environmental benefits from 2008 – 2012 shown in Table 4.

Table 3. Projected Capacity and Energy Benefits

Annual Incremental Savings	2008	2009	2010	2011	2012
Non-coincident peak (kW)	1,297	1,396	1,458	1,502	1,525
Coincident peak (kW)	1,170	1,259	1,315	1,354	1,375
Energy Savings (kWh)	6,459,101	6,950,764	7,261,562	7,479,409	7,595,287

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Table 4. Projected Environmental Benefits, 2008 - 2012

Water Savings	17,873,062	Gallons
SOx	85,433	Lbs
NOx	141,912	Lbs
CO2	74,637,906	Lbs

Program Cost Effectiveness

Table 5 provides a summary of the benefit/cost analysis results for this program. A detailed benefit/cost analysis is presented in Appendix 2.

Table 5. Benefit-cost analysis results

Cost Effectiveness Tests	TRC	TRCS	RIM
Benefit/Cost Ratio	2.11	2.62	0.54

In addition to estimating the savings from each measure, this analysis relies on a range of other assumptions and financial data provided in Table 6. Because the program consists of a variety of measure, each with a unique avoided cost and economic useful life, these metrics are not provided in Table 6 but can be found in the individual measure analysis worksheets.

Table 6. Other Financial Assumptions

Ratio of Non-inc to Incentive Costs	70.5%
IRP Discount Rate	8.50%
Social Discount Rate	5.00%
Weighted Average NTG Ratio:	90%

Program Costs (Budget)

The program budget for 2008 of \$1,300,000 will be allocated as shown in Table 7, while Table 8 provides the expected program budgets through 2012. Appendix 1 provides addition details on the 2008 budget.

Table 7. 2008 Program Budget

Total Program Budget	\$1,300,000
Total Administrative and O&M Cost Allocation	\$234,000
Managerial & Clerical	\$187,200
Travel & Direct Expenses	\$28,080
Overhead	\$18,720
Total Marketing Allocation	\$130,000
Internal Marketing Expense	\$65,000
Subcontracted Marketing Expense	\$65,000
Total Direct Implementation	\$871,000
Financial Incentives	\$731,640
Support Activity Labor	\$34,840

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Hardware & Materials	\$17,420
Rebate Processing & Inspection	\$87,100
Total EM&V Cost Allocation	\$65,000
EM&V / Research Activity	\$61,750
EM&V Overhead	\$3,250

Table 8. 2008 – 2012 Program Budget

Year	2008	2009	2010	2011	2012
Total Budget	\$1,300,000	\$1,339,000	\$1,379,170	\$1,420,545	\$1,463,161
Incentives	\$731,640	\$787,332	\$822,537	\$847,213	\$860,339
Administrative Costs	\$568,360	\$551,668	\$556,633	\$573,332	\$602,823
Incentives as % of Budget	56.3%	58.8%	59.6%	59.6%	58.8%

Measurement, Evaluation, and Research

TEP will adopt a strategy that calls for integrated data collection that is designed to provide a quality data resource for program tracking, management and evaluation. This approach will entail the following primary activities:

- **Database management** - As part of program operation, TEP or an approved contractor will collect the necessary data elements to populate the tracking database and provide periodic reporting.
- **Integrated implementation data collection** - TEP will work with the implementation contractor to establish systems to collect the data needed to support effective program management and evaluation through the implementation and customer application processes. The database tracking system will be integrated with implementation data collection processes.
- **Field verification** – TEP or an approved contractor will conduct field verification of the installation of a sample of measures throughout the implementation of the program.
- **Tracking of savings using deemed savings values** - TEP will develop deemed savings values for each measure and technology promoted by the program and periodically review and revise the savings values to be consistent with program participation and accurately estimate the savings being achieved by the program.

This approach will provide TEP with ongoing feedback on program progress and enable management to adjust or correct the program measures to be more effective, provide a higher level of service, and be more cost beneficial. Integrated data collection will provide a high quality data resource for evaluation activities.

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Appendix 1 – Program Costs

Budget Items	Budget	Allocation Rate (%)
Administrative		
Managerial and Clerical Labor	\$187,200	
Labor - Clerical	\$9,360	5.0%
Labor - Program Design	\$9,360	5.0%
Labor - Program Development	\$9,360	5.0%
Labor - Program Planning	\$28,080	15.0%
Labor - Program/Project Management	\$18,720	10.0%
Labor - Staff Management	\$18,720	10.0%
Labor - Staff Supervision	\$9,360	5.0%
Subcontractor Labor - Clerical	\$9,360	5.0%
Subcontractor Labor - Program Design	\$18,720	10.0%
Subcontractor Labor - Program Development	\$9,360	5.0%
Subcontractor Labor - Program Planning	\$9,360	5.0%
Subcontractor Labor - Program/Project Management	\$37,440	20.0%
Subcontractor Labor - Staff Management	\$0	0.0%
Subcontractor Labor - Staff Supervision	\$0	0.0%
<i>Subtotal Managerial and Clerical Labor</i>	<i>\$187,200</i>	<i>100.0%</i>
Travel & Direct Expenses	\$28,080	
Conference Fees	\$2,808	10.0%
Labor - Conference Attendance	\$2,808	10.0%
Subcontractor - Conference Fees	\$562	2.0%
Subcontractor - Travel - Airfare	\$1,123	4.0%
Subcontractor - Travel - Lodging	\$562	2.0%
Subcontractor - Travel - Meals	\$562	2.0%
Subcontractor - Travel - Mileage	\$562	2.0%
Subcontractor - Travel - Parking	\$562	2.0%
Subcontractor - Travel - Per Diem for Misc. Expenses	\$2,527	9.0%
Subcontractor Labor - Conference Attendance	\$562	2.0%
Travel - Airfare	\$3,931	14.0%
Travel - Lodging	\$2,808	10.0%
Travel - Meals	\$1,404	5.0%
Travel - Mileage	\$1,404	5.0%
Travel - Parking	\$842	3.0%
Travel - Per Diem for Misc. Expenses	\$5,054	18.0%
<i>Travel & Direct Expenses</i>	<i>\$28,080</i>	<i>100.0%</i>
Overhead (General and Administrative) - Labor and Materials	\$18,720	
Equipment - Communications	\$374	2.0%
Equipment - Computing	\$374	2.0%
Equipment - Document Reproduction	\$374	2.0%
Equipment - General Office	\$374	2.0%
Equipment - Transportation	\$374	2.0%
Facilities - Lease/Rent Payment	\$0	0.0%
Labor - Accounts Payable	\$187	1.0%
Labor - Accounts Receivable	\$187	1.0%
Labor - Administrative	\$187	1.0%

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Labor - Automated Systems	\$0	0.0%
Labor - Communications	\$187	1.0%
Labor - Contract Reporting	\$187	1.0%
Labor - Corporate Services	\$187	1.0%
Labor - Facilities Maintenance	\$187	1.0%
Labor - Information Technology	\$187	1.0%
Labor - Materials Management	\$187	1.0%
Labor - Procurement	\$187	1.0%
Labor - Regulatory Reporting	\$7,488	40.0%
Labor - Shop Services	\$187	1.0%
Labor - Telecommunications	\$187	1.0%
Labor - Transportation Services	\$187	1.0%
Office Supplies	\$187	1.0%
Postage	\$187	1.0%
Subcontractor - Equipment - Communications	\$0	0.0%
Subcontractor - Equipment - Computing	\$0	0.0%
Subcontractor - Equipment - Document Reproduction	\$0	0.0%
Subcontractor - Equipment - General Office	\$0	0.0%
Subcontractor - Equipment - Transportation	\$0	0.0%
Subcontractor - Facilities - Lease/Rent Payment	\$0	0.0%
Subcontractor - Office Supplies	\$0	0.0%
Subcontractor - Postage	\$0	0.0%
Subcontractor Labor - Accounts Payable	\$0	0.0%
Subcontractor Labor - Accounts Receivable	\$0	0.0%
Subcontractor Labor - Administrative	\$0	0.0%
Subcontractor Labor - Automated Systems	\$0	0.0%
Subcontractor Labor - Communications	\$0	0.0%
Subcontractor Labor - Contract Reporting	\$0	0.0%
Subcontractor Labor - Corporate Services	\$0	0.0%
Subcontractor Labor - Facilities Maintenance	\$0	0.0%
Subcontractor Labor - Information Technology	\$0	0.0%
Subcontractor Labor - Materials Management	\$0	0.0%
Subcontractor Labor - Procurement	\$0	0.0%
Subcontractor Labor - Regulatory Reporting	\$6,552	35.0%
Subcontractor Labor - Shop Services	\$0	0.0%
Subcontractor Labor - Telecommunications	\$0	0.0%
Subcontractor Labor - Transportation Services	\$0	0.0%
<i>Subtotal Overhead</i>	<i>\$18,720</i>	<i>100.0%</i>
Total Administrative Costs	\$234,000	
Marketing/Advertising/Outreach		
Internal Marketing Expense	\$65,000	
Advertisements / Media Promotions	\$16,250	25.0%
Bill Inserts	\$2,600	4.0%
Brochures	\$3,900	6.0%
Door Hangers	\$0	0.0%
Labor - Business Outreach	\$3,250	5.0%
Labor - Customer Outreach	\$3,250	5.0%
Labor - Customer Relations	\$3,250	5.0%

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Labor - Marketing	\$19,500	30.0%
Print Advertisements	\$9,750	15.0%
Radio Spots	\$3,250	5.0%
<i>Subtotal Internal Marketing Expense</i>	<i>\$65,000</i>	<i>100.0%</i>
Subcontracted Marketing Expense	\$65,000	
Subcontractor - Bill Inserts	\$3,250	5.0%
Subcontractor - Brochures	\$3,250	5.0%
Subcontractor - Door Hangers	\$0	0.0%
Subcontractor - Print Advertisements	\$0	0.0%
Subcontractor - Radio Spots	\$6,500	10.0%
Subcontractor - Television Spots	\$0	0.0%
Subcontractor Labor - Business Outreach	\$3,250	5.0%
Subcontractor Labor - Customer Outreach	\$3,250	5.0%
Subcontractor Labor - Customer Relations	\$3,250	5.0%
Subcontractor Labor - Marketing	\$3,250	5.0%
Television Spots	\$0	0.0%
Website Development	\$39,000	60.0%
<i>Subtotal Subcontracted Marketing Expense</i>	<i>\$65,000</i>	<i>100.0%</i>
Total Marketing/Advertising/Outreach	\$130,000	
Direct Implementation		
Financial Incentives to Customers	\$731,640	
Activity - Labor	\$34,840	
Labor - Curriculum Development	\$2,787	8.0%
Labor - Customer Education and Training	\$13,936	40.0%
Labor - Customer Equipment Testing and Diagnostics	\$0	0.0%
Labor - Facilities Audits	\$10,452	30.0%
Subcontractor Labor - Facilities Audits	\$3,484	10.0%
Subcontractor Labor - Curriculum Development	\$1,742	5.0%
Subcontractor Labor - Customer Education and Training	\$1,742	5.0%
Subcontractor Labor - Customer Equipment Testing and Diagnostics	\$697	2.0%
<i>Subtotal Activity</i>	<i>\$34,840</i>	<i>100.0%</i>
Hardware and Materials - Installation and Other DI Activity	\$17,420	
Audit Applications and Forms	\$1,394	8.0%
Direct Implementation Literature	\$3,484	20.0%
Education Materials	\$3,484	20.0%
Energy Measurement Tools	\$1,742	10.0%
Installation Hardware	\$1,742	10.0%
Subcontractor - Direct Implementation Literature	\$697	4.0%
Subcontractor - Education Materials	\$697	4.0%
Subcontractor - Energy Measurement Tools	\$2,787	16.0%
Subcontractor - Installation Hardware	\$1,045	6.0%
Subcontractor - Audit Applications and Forms	\$348	2.0%
<i>Subtotal Hardware and Materials</i>	<i>\$17,420</i>	<i>100.0%</i>
Rebate Processing and Inspection - Labor and Materials	\$87,100	
Labor - Field Verification	\$8,710	10.0%
Labor - Rebate Processing	\$0	0.0%
Labor - Site Inspections	\$8,710	10.0%
Rebate Applications	\$0	0.0%

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Subcontractor - Rebate Applications	\$8,710	10.0%
Subcontractor Labor - Field Verification	\$17,420	20.0%
Subcontractor Labor - Rebate Processing	\$26,130	30.0%
Subcontractor Labor - Site Inspections	\$17,420	20.0%
<i>Subtotal Rebate Processing and Inspection</i>	<i>\$87,100</i>	<i>100.0%</i>
Total Direct Implementation	\$871,000	
Evaluation, Measurement and Verification		
EM&V Labor and Materials	\$61,750	
Labor - EM&V	\$3,088	5.0%
Materials - EM&V	\$3,088	5.0%
Subcontractor Labor - EM&V	\$55,575	90.0%
<i>Subtotal EM&V Activity - Labor</i>	<i>\$61,750</i>	<i>100.0%</i>
EM&V Overhead	\$3,250	
Benefits - EM&V Labor	\$0	0.0%
Overhead - EM&V	\$1,625	50.0%
Subcontractor Overhead - EM&V	\$0	0.0%
Subcontractor Travel - EM&V	\$0	0.0%
Travel - EM&V	\$1,625	50.0%
<i>Subtotal EM&V Overhead</i>	<i>\$3,250</i>	<i>100.0%</i>
Total EM&V	\$65,000	
Total Budget	\$1,300,000	

Small Business Program

Appendix 2 – Benefit/Cost Analysis

Net Present Value Analysis

Year	2008	2009	2010	2011	2012	Total
Total budget	\$1,300,000	\$1,339,000	\$1,379,170	\$1,420,545	\$1,463,161	\$6,901,877
Incentives	\$731,640	\$787,332	\$822,537	\$847,213	\$860,339	\$4,049,061
Administrative Costs	\$568,360	\$551,668	\$556,633	\$573,332	\$602,823	\$2,852,816
Incentives as % of budget	56.3%	58.8%	59.6%	59.6%	58.8%	
Admin to incentives	77.68%	70.07%	67.67%	67.67%	70.07%	70.46%
Non-coincident peak (kW)	1,297	1,396	1,458	1,502	1,525	7,179
Coincident peak (kW)	1,170	1,259	1,315	1,354	1,375	6,473
Energy Savings (kWh)	6,459,101	6,950,764	7,261,562	7,479,409	7,595,287	35,746,124
Societal Cost Test Net Benefits						
Social PV Benefit (\$)	\$3,655,264	\$3,933,501	\$4,109,385	\$4,232,666	\$4,298,243	\$20,229,058
PV Program Cost (\$)	\$1,394,757	\$1,500,925	\$1,568,038	\$1,615,079	\$1,640,101	\$7,718,900
NPV (\$)	\$2,260,507	\$2,432,576	\$2,541,347	\$2,617,587	\$2,658,141	\$12,510,159

TRC Net Benefits

Societal Benefits - IRP	\$2,948,110	\$3,172,518	\$3,314,375	\$3,413,806	\$3,466,696	\$16,315,504
PV Program Cost (\$)	\$1,394,757	\$1,500,925	\$1,568,038	\$1,615,079	\$1,640,101	\$7,718,900
NPV (\$)	\$1,553,353	\$1,671,593	\$1,746,337	\$1,798,727	\$1,826,595	\$8,596,605

Benefit/Cost Ratios

TRC	2.11
Societal Cost Test	2.62
RIM	0.54

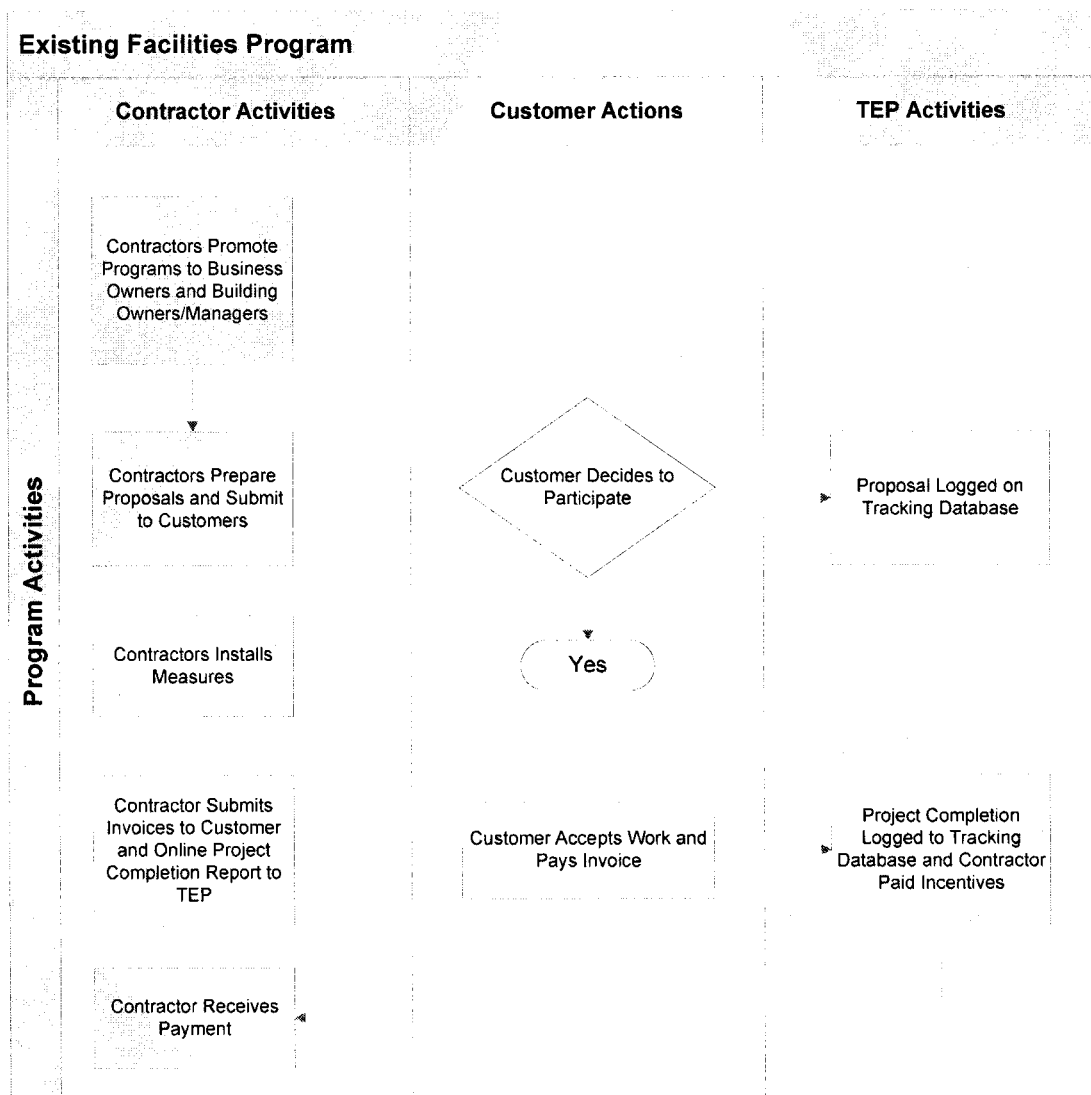
Small Business Program

Measure Description	Portfolio weight	Target Units	Incremental Cost (\$)	Target Unit Definition	Non-Coin. Demand Savings (KW)	Coin. Demand Savings (KW)	Total Energy Savings (kWh)
Retrofit T12 Systems with T8 Systems and Electronic Ballasts	42.0%	9,256	\$42.42	Fixtures	388	337	1,652,045
Retrofit Incandescent to Integral Compact Fluorescent Lighting (CFL)	11.0%	11,256	\$9.17	Lamps	644	599	2,744,138
Energy Efficient Exit Signs	4.0%	488	\$73.47	Fixtures	16	16	137,852
Delamping	7.0%	1,163	\$54.57	Fixtures	85	74	361,323
Occupancy Sensors on Lighting	1.0%	113	\$80.00	Connected kW	6	6	126,850
Add On/Off Controls on Evap Fan Motor	4.0%	12	\$2,950.00	Control	0	0	137,848
Anti-Sweat Heater Controls	5.0%	27	\$1,850.00	Door pair	9	8	185,714
Integrated Controls and Motor Retrofit on Case Coolers and Freezers	6.0%	7	\$8,355.00	Case	9	8	214,544
High Efficiency Evaporator Fan Motors	2.0%	106	\$204.02	Motor	33	29	210,336
Energy Efficient Packaged and Split Air Conditioners	7.0%	153	\$406.63	Unit	54	47	106,933
Energy Efficient Packaged and Split Heat Pumps	7.0%	153	\$499.15	Unit	54	47	174,135
Programmable Thermostats (Heating Setback / Cooling Setup)	4.0%	195	\$193.56	Unit	0	0	407,383

Portfolio Weighting	Weighted PV of TRC Benefit (\$)	Weighted PV of Societal Benefit (\$)	Weighted Incentive (\$)	Weighted PV Program Cost (\$)	Weighted Incremental Cost (\$)	Average TRC	Average Societal Cost Test
Retrofit T12 Systems with T8 Systems and Electronic Ballasts	\$60.33	\$77.88	\$13.94	\$26.87	\$17.82	2.25	2.90
Retrofit Incandescent to Integral Compact Fluorescent Lighting (CFL)	\$4.03	\$4.23	\$0.79	\$1.52	\$1.01	2.66	2.79
Energy Efficient Exit Signs	\$8.24	\$10.85	\$2.40	\$4.51	\$2.94	1.83	2.41
Delamping	\$17.51	\$22.60	\$3.08	\$5.83	\$3.82	3.00	3.87
Occupancy Sensors on Lighting	\$5.43	\$6.55	\$0.65	\$1.22	\$0.80	4.43	5.35
Add On/Off Controls on Evap Fan Motor	\$209.28	\$252.55	\$100.00	\$183.88	\$118.00	1.14	1.37
Anti-Sweat Heater Controls	\$164.73	\$198.79	\$67.50	\$135.69	\$92.50	1.21	1.47
Integrated Controls and Motor Retrofit on Case Coolers and Freezers	\$867.77	\$1,047.19	\$372.00	\$740.15	\$501.30	1.17	1.41
High Efficiency Evaporator Fan Motors	\$25.48	\$31.85	\$2.75	\$5.81	\$4.08	4.39	5.48
Energy Efficient Packaged and Split Air Conditioners	\$46.73	\$58.41	\$23.40	\$40.95	\$28.46	1.14	1.43
Energy Efficient Packaged and Split Heat Pumps	\$67.85	\$84.81	\$23.40	\$46.13	\$34.94	1.47	1.84
Programmable Thermostats (Heating Setback / Cooling Setup)	\$23.41	\$27.90	\$6.00	\$9.31	\$7.74	2.52	3.00

Small Business Program

Appendix 3 – Small business Implementation Process



EXHIBIT

DAS-2

TEP's DSM Adjustor Methodology Calculation Description and Example

Annually TEP shall file support for modification to its DSM Adjustor Rate for the following year. The DSM Adjustor Mechanism will provide revenue recovery for: 1) expenses incurred by TEP for all DSM program implementation; 2) the TEP performance incentive; and 3) enhanced financial incentives for energy efficient equipment installed by TEP or its customers and approved for such incentives in advance by the ACC Staff.

The filing for modification of the DSM Adjustor Mechanism Rate for example year 2009 will include the following information:

- (1) A list of the expected costs of each DSM program for the next year, in this example 2009. The expected expenses will be itemized into the cost categories of: (1) Planning and Administration, (2) Program Incentives, (3) Program Management, (4) Consumer Outreach and Education, (5) Program Implementation, (6) Training and Technical Assistance, and (7) Evaluation of Program Results. The total of these expected costs is the total DSM expenses of the next year ("TDSMENY").
- (2) A list of the actual expenses of each DSM program provided in the previous year, in this example 2007, in the cost categories of: (1) Planning and Administration, (2) Program Incentives, (3) Program Management, (4) Consumer Outreach and Education, (5) Program Implementation, (6) Training and Technical Assistance, and (7) Evaluation of Program Results. The total of these actual expenses is the total DSM expenses of the previous year ("ADSMEPY").
- (3) The actual revenue produced by the DSM Adjustor Mechanism the previous year ("ADSMRPY") calculated by multiplying the DSM Adjustor Mechanism Rate in the previous year, in this example 2008, by the retail energy kWh sold in the previous year.
- (4) The TEP DSM Performance Incentive Revenue Requirement expected to be recovered in the previous year, in this example 2007, ("ADSMPPY").
- (5) The TEP DSM Efficiency Incentive Mechanism Revenue Requirement expected to be recovered in the previous year, in this example 2007, ("ADSMIPY").
- (6) Estimated total DSM qualifying adjusted retail sales of electrical energy in kWh for the next year, in this example 2009, ("TRSOEE"), before expected DSM program-created energy consumption reductions are included.
- (7) The estimated DSM program-created energy consumption reductions in the next year, in this example 2009. ("DSMECRCY")

The DSM Basic Program Rate ("DSMBPR") would then be calculated as:

$$\text{DSMBPR } (\$/\text{kWh}) = ((\text{TDSMENY (1)} + \text{ADSMEPY (2)} + \text{ADSMPPY (4)} + \text{ADSMIPY (5)} - \text{ADSMRPY (3)}) / (\text{TRSOEE (6)} - \text{DSMECRCY (7)}))$$

The DSM Adjustor Mechanism Rate ("DSMAMR") would then be calculated as the sum of the DSM Basic Program Rate, the projected DSM Efficiency Incentive Rate ("DSMEIR") and the projected DSM Performance Incentive Adjustor Rate ("DSMPAR"):

$$\text{DSMAMR in } \$/\text{kWh} = (\text{DSMBPR} + \text{DSMEIR} + \text{DSMDAR})$$

A hypothetical example calculating the DSMAMR for this example in year 2009:

- In 2007, the ADSMEPY (2) from operating the DSM program was \$10,450,252.
- In 2007, the ADSMPPY (4) was to have been \$520,000.00.

- In 2007, the ADSMIPY (5) was to have been \$214,000.00.
- In 2007, the ADSMRPY (3) billed and received was \$11,217,936.
- The calculated DSMEIR is \$0.00000085 / kWh for 2009.
- The calculated DSMDAR is \$0.00061635 / kWh for 2009.
- For 2009, TEP proposes a DSM program with expected TDSMENY (1) cost of \$12,500,000.
- The 2009 estimated TRSOEE (6) before DSM measures are expected to be 10,076,379,461 kWh.
- DSMECRCY (7) in 2009 are expected to be 34,700,000 kWh.

The DSM Basic Program Rate for example year 2009 would be:

$$((12,500,000 + 10,450,252 + 520,000 + 214,000 - 11,217,936) / (10,076,379,461 - 34,700,000)) = \$0.001241 / \text{kWh}$$

This would then be added to the DSMPAR and DSMEIR to build the DSM Adjustor Mechanism Tariff Rate for example year 2009:

$$\$0.00124146 + \$0.00061635 + \$0.00000085 = \$0.001859 \text{ per kWh}$$

Thus completing the rate schedule for the DSM Tiers:

Tier 1 DSM Rate = \$0.000000 per kWh.
Tier 2 DSM Rate = \$0.001859 per kWh.
Tier 3 DSM Rate = \$0.005576 per kWh.

EXHIBIT

DAS-3

Description of DSM Adjustor Mechanism Tariff Rate Example 2008

Concept:

- All customers will be billed for DSM on a per kWh of energy consumed per monthly billing period basis. However, different customer classes will be billed in different manners as follows:
 - **Residential Class (Rates 1, 21, 70, 201):** Residential customers will not be billed any DSM charges on the first 500 kWh of monthly energy consumption. For monthly energy consumption above 500 kWh but less than 3,500 kWh, the customer will be billed at the Second Tier DSM rate. For monthly energy consumption above 3,500 kWh, the customer will be billed at the Third Tier DSM rate.
 - **Small General Service Class (Rates 10, 76):** Commercial customers will not be billed any DSM charges on the first 500 kWh of monthly energy consumption. For monthly energy consumption above 500 kWh but less than 55,000 kWh, the customer will be billed at the Second Tier DSM rate. For monthly energy consumption above 55,000 kWh, the customer will be billed at the Third Tier DSM rate.
 - All other customers billed on a monthly energy consumption basis will be billed at the Second Tier DSM rate for all kWh of energy consumed per month.
- The Third Tier DSM rate will be three times the Second Tier DSM rate.

Rate Structure for First Year (2008):

- First Tier DSM rate = \$0.0000 per kWh of applicable monthly consumption
- Second Tier DSM rate = \$0.000625 per kWh of applicable monthly consumption
- Third Tier DSM rate = \$0.001875 per kWh of applicable monthly consumption

Sample Bill Example Calculations:

- Example #1: Residential customer consumes 450 kWh in the month. The first 500 kWh are exempt from the DSM charge. Therefore the DSM charge = \$0.00 for the

month. This represents an average consumption of 0.6 kW for all hours of the month, a bit less than average.

(Average year round TEP residential customer monthly consumption is about 960 kWh which represents average consumption of 1.33 kW for all hours of the month.)

- Example #2: Residential customer consumes 1,250 kWh in the month. The first 500 kWh are exempt from the DSM charge. The remaining $(1,250 - 500 =) 750$ kWh are billed at the Second Tier DSM rate of $\$0.000625/\text{kWh} = \0.47 for the month. This represents an average consumption of 1.7 kW for all hours of the month, a bit more than average.
- Example #3: Residential customer consumes 5,250 kWh in the month. The first 500 kWh are exempt from the DSM charge. The next $(3,500 - 500 =) 3,000$ kWh are billed at the Second Tier DSM rate of $\$0.000625/\text{kWh} = \1.88 for the month. \$1.88 is then added to the Third Tier DSM billed energy of $(5,250 - 3,500 =) 1,750$ kWh times $\$0.001875 = \3.28 , for a total DSM charge of \$5.16 for the month. This represents an average consumption of 7.3 kW for all hours of the month, a lot more than average.
- Example #4: A small Commercial customer consumes 3,250 kWh in the month. The first 500 kWh are exempt from the DSM charge. The remaining $(3,250 - 500 =) 2,750$ kWh are billed at the Second Tier DSM rate of $\$0.000625/\text{kWh} = \1.72 for the month. This represents an average consumption of 4.5 kW for all hours of the month.
- Example #5: A larger Commercial customer consumes 75,250 kWh in the month. The first 500 kWh are exempt from the DSM charge. The next $(55,000 - 500 =) 54,500$ kWh are billed at the Second Tier DSM rate of $\$0.000625/\text{kWh} = \34.06 for the month. \$34.06 is then added to the Third Tier DSM billed energy of $(75,250 - 55,000 =) 20,250$ kWh times $\$0.001875 = \37.97 , for a total DSM charge of \$72.03 for the month. This represents an average consumption of 104.5 kW for all hours of the month.
- Example #6: A medium size Industrial customer consumes 3,275,000 kWh in the month. All kWhs are billed at the Second Tier DSM rate of $\$0.000625$ per kWh which results in a DSM charge of \$2046.88 for the month. This represents an average consumption of 4,549 kW for all hours of the month.

EXHIBIT

DAS-4

DSM AM Calculation

DSM Adjustor Mechanism Tariff (example)

Customer Class	Customer Months	Annual Energy Consumption - KWH	1st Tier - KWH @ 0X	2nd Tier - KWH @ 1X	3rd Tier - KWH @ 3X	DSMAMTR Energy Equivalent
Residential						
Rate 01						
Single Phase Customer Months	4,102,937					
Poly Phase Customer Months	3,804					
Summer Monthly Energy 1st 500 kWh		157,191,445	157,191,445			0
Summer Monthly Energy Next 3000 kWh		1,944,859,708		1,944,859,708		1,944,859,708
Summer monthly Energy over 3500 kWh		140,610,250			140,610,250	421,830,751
Winter Monthly Energy 1st 500 kWh		280,753,681	280,753,681			0
Winter Monthly Energy Next 3000 kWh		1,095,328,529		1,095,328,529		1,095,328,529
Winter Monthly Energy over 3500 kWh		21,914,549			21,914,549	65,743,647
Subtotal	4,106,741	3,640,658,163	437,945,126	3,040,188,237	162,524,799	3,527,762,635
% of Annual Energy Per Category			12.03%	83.51%	4.46%	96.90%
Rate 21						
Single Phase Customer Months	34,512					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		291,925	291,925			0
Summer Monthly Energy Next 3000 kWh		26,169,378		26,169,378		26,169,378
Summer monthly Energy over 3500 kWh		4,405,393			4,405,393	13,216,180
Winter Monthly Energy 1st 500 kWh		636,300	636,300			0
Winter Monthly Energy Next 3000 kWh		20,392,657		20,392,657		20,392,657
Winter Monthly Energy over 3500 kWh		720,269			720,269	2,160,807
Subtotal	34,512	52,615,922	928,225	46,562,035	5,125,662	61,939,022
% of Annual Energy Per Category			1.76%	88.49%	9.74%	117.72%
Rate 70						
Single Phase Customer Months	50,748					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		838,733	838,733			0
Summer Monthly Energy Next 3000 kWh		34,156,925		34,156,925		34,156,925
Summer monthly Energy over 3500 kWh		3,846,009			3,846,009	11,538,027
Winter Monthly Energy 1st 500 kWh		2,116,434	2,116,434			0
Winter Monthly Energy Next 3000 kWh		22,582,213		22,582,213		22,582,213
Winter Monthly Energy over 3500 kWh		610,107			610,107	1,830,320
Subtotal	50,748	64,150,421	2,955,167	56,739,139	4,456,116	70,107,486
% of Annual Energy Per Category			4.61%	88.45%	6.95%	109.29%
Rate 201 A						
Single Phase Customer Months	86,138					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		1,698,038	1,698,038			0
Summer Monthly Energy Next 3000 kWh		48,260,469		48,260,469		48,260,469
Summer monthly Energy over 3500 kWh		3,086,079			3,086,079	9,258,236
Winter Monthly Energy 1st 500 kWh		3,035,325	3,035,325			0
Winter Monthly Energy Next 3000 kWh		34,712,462		34,712,462		34,712,462
Winter Monthly Energy over 3500 kWh		802,397			802,397	2,407,191
Subtotal	86,138	91,594,770	4,733,363	82,972,931	3,888,476	94,638,359
% of Annual Energy Per Category			5.17%	90.59%	4.25%	103.32%
Rate 201 B						
Single Phase Customer Months	6,353					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		124,686	124,686			0
Summer Monthly Energy Next 3000 kWh		3,485,102		3,485,102		3,485,102
Summer monthly Energy over 3500 kWh		451,491			451,491	1,354,473
Winter Monthly Energy 1st 500 kWh		155,813	155,813			0
Winter Monthly Energy Next 3000 kWh		2,882,298		2,882,298		2,882,298
Winter Monthly Energy over 3500 kWh		489,048			489,048	1,467,144
Subtotal	6,353	7,588,438	280,499	6,367,401	940,539	9,189,017
% of Annual Energy Per Category			3.70%	83.91%	12.39%	121.09%

Rate 201 CSingle Phase Customer Months
Poly Phase Customer Months

2,560

Summer Monthly Energy 1st 500 kWh	77,688	77,688			0
Summer Monthly Energy Next 3000 kWh	1,213,451		1,213,451		1,213,451
Summer monthly Energy over 3500 kWh	83,921			83,921	251,764
Winter Monthly Energy 1st 500 kWh	109,123	109,123			0
Winter Monthly Energy Next 3000 kWh	811,362		811,362		811,362
Winter Monthly Energy over 3500 kWh	188,566			188,566	565,699
Subtotal	2,560	2,484,111	186,811	2,024,813	2,842,276
% of Annual Energy Per Category			7.52%	81.51%	114.42%
Total Residential	4,287,053	3,859,091,826	447,029,190	3,234,854,556	177,208,079
					3,766,478,794

Commercial**Rate 10**Single Phase Customer Months
Poly Phase Customer Months

200,229

192,377

Summer Monthly Energy 1st 500 kWh	9,543,561	9,543,561	0	0	0
Summer Monthly Energy Next 54,500 kWh	780,251,167	0	780,251,167	0	780,251,167
Summer monthly Energy over 55,000 kWh	233,743,492	0	0	233,743,492	701,230,477
Winter Monthly Energy 1st 500 kWh	11,972,322	11,972,322	0	0	0
Winter Monthly Energy Next 54,500 kWh	600,068,846	0	600,068,846	0	600,068,846
Winter Monthly Energy over 55,000 kWh	128,074,365	0	0	128,074,365	384,223,096
Subtotal	392,606	1,763,653,755	21,515,883	1,380,320,014	2,465,773,587
% of Annual Energy Per Category			1.22%	78.26%	139.81%

Rate 76Single Phase Customer Months
Poly Phase Customer Months

4,203

7,473

Summer Monthly Energy 1st 500 kWh	275,230	275,230	0	0	0
Summer Monthly Energy Next 54,500 kWh	59,906,836	0	59,906,836	0	59,906,836
Summer monthly Energy over 55,000 kWh	15,467,659	0	0	15,467,659	46,402,976
Winter Monthly Energy 1st 500 kWh	263,000	263,000	0	0	0
Winter Monthly Energy Next 54,500 kWh	53,958,136	0	53,958,136	0	53,958,136
Winter Monthly Energy over 55,000 kWh	6,856,871	0	0	6,856,871	20,570,613
Subtotal	11,676	136,727,732	538,230	113,864,972	180,838,561
% of Annual Energy Per Category			0.39%	83.28%	132.26%

Rate 11Single Phase Customer Months
Poly Phase Customer Months

3,948

336

Annual kWh	60,332,539	0	60,332,539	0	60,332,539
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Rate 31

Rate 31	499	16,196,892	0	16,196,892	0
					16,196,892

Total Commercial	408,729	1,916,582,327	22,054,113	1,510,381,879	384,142,387
					2,662,809,041

Industrial

RT-13	7,200	1,204,228,137	0	1,204,228,137	0
RT-13PRS	24	4,088,075	0	4,088,075	0
RT-14	96	614,097,291	0	614,097,291	0
RT-14PRS	12	93,850,178	0	93,850,178	0
RT-85	612	128,481,410	0	128,481,410	0
RT-90	60	241,242,523	0	241,242,523	0
Subtotal	8,004	2,285,987,614	0	2,285,987,614	0
% of Annual Energy Per Category			0.00%	100.00%	0.00%

Mining

RT-15	24	926,300,900	0	926,300,900	0
% of Annual Energy Per Category			0.00%	100.00%	0.00%

Public Streets and Highway Lighting

RT-41	48	24,132,797	0	24,132,797	0	24,132,797
RT-47	48	9,397,676	0	9,397,676	0	9,397,676
Subtotal	96	33,530,473	0	33,530,473	0	33,530,473
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Other Sales - Public Authorities

RT-40	36	101,171,460	0	101,171,460	0	101,171,460
RT-43	3,212	123,574,584	0	123,574,584	0	123,574,584
Subtotal	3,248	224,746,044	0	224,746,044	0	224,746,044
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Lighting

RT-50	216		0	0	0	0
RT-51	14,628		0	0	0	0
RT-52	39,276		0	0	0	0
Subtotal	53,904	7,287,604	0	7,287,604	0	7,287,604
% of Annual Energy Per Category			0.00%	0.00%	0.00%	100.00%

Estimated
Total DSM
Qualifying
Adjusted
Retail Sales

Total	4,707,154	9,246,239,184	469,083,303	8,215,801,466	561,350,467	9,899,852,866
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% of Annual Energy Per Category =			5.29%	92.61%	6.33%	111.58%
% of Annual DSM Revenue Per Category =			0.00%	82.99%	17.01%	

Energy consumption Growth Rate for Next Year without DSM 3.59%

DSM Program Energy Consumption Reduction Expected in kWh next year: 34,700,000

Expected Cost DSM Programs for Next Year (TDSMENY) = \$12,500,000

Operating cost from the previous year (ADSMEPY) = \$10,450,252

The proposed TEP Efficiency Incentive from the previous year (ADSMIPY) = \$214,000

The proposed TEP Performance Incentive from the previous year (ADSMPPY) = \$520,000

The Actual Revenue produced by the previous years Adjustor mechanism (ADSMRPY) = \$11,217,936

The DSM Basic Program Dollars = \$12,466,316

Basic DSM Adjustor Mechanism Tariff Rate Second Tier per KWH = \$0.00121973

DSM Performance Incentive Adjustor Rate \$0.00061635

DSM TEP Efficiency Incentive Adjustor Rate \$0.00002314

DSM Adjustor Mechanism Tariff Rate First Tier per KWH = \$0.00000000

DSM Adjustor Mechanism Tariff Rate Second Tier per KWH = \$0.00185922

DSM Adjustor Mechanism Tariff Rate Third Tier per KWH =

Residential RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL- R01 - FROZEN	
1	Customers (Single-Phase)	4,102,937
2	Customer (Three-Phase)	3,804
	<u>Summer</u>	
4	1st 500 kWhs	157,191,445
5	3,000 kWhs	1,944,859,708
6	3,501 kWhs and above	140,610,250
	<u>Winter</u>	
7	1st 500 kWhs	280,753,681
8	3,000 kWhs	1,095,328,529
9	3,501 kWhs and above	21,914,549
10	Revenue	
11	TOTAL R01 - FROZEN	kWh 3,640,658,163
12		Cust 342,228
	RESIDENTIAL WATER HEATING - R02	
13	Customers	28,728
14	1st 100 kWhs - is a customer charge	2,472,456
15	All Additional kWhs	2,788,089
16	Revenue	
17	TOTAL R02	kWh 5,260,545
18		Cust

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL TIME OF USE - R21 - ELIMINATED - REPLACED BY NEW TIME OF USE - R70N	
1	Customer Charge	34,512
	<u>Summer On Peak</u>	
2	1st 500 kWhs	117,504
3	3,000 kWhs	10,533,594
4	3,501 kWhs and above	1,773,241
	<u>Summer Off Peak</u>	
5	1st 500 kWhs	174,420
6	3,000 kWhs	15,635,784
7	3,501 kWhs and above	2,632,152
	<u>Summer Shoulder Peak</u>	
8	1st 500 kWhs	0
9	3,000 kWhs	0
10	3,501 kWhs and above	0
	<u>Winter On Peak</u>	
11	1st 500 kWhs	149,837
12	3,000 kWhs	4,802,085
13	3,501 kWhs and above	169,610
	<u>Winter Off Peak</u>	
14	1st 500 kWhs	486,463
15	3,000 kWhs	15,590,572
16	3,501 kWhs and above	550,659
17	Revenue	
18	TOTAL R21	
	kWh	52,615,922
	Cust	2,876

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL TIME OF USE - R70 - ELIMINATED - REPLACED BY NEW TIME OF USE - R70N	
1	Customers	50,748
	<u>Summer On Peak</u>	
2	1st 500 kWhs	150,911
3	3,000 kWhs	6,145,782
4	3,501 kWhs and above	692,004
	<u>Summer Off Peak</u>	
5	1st 500 kWhs	628,225
6	3,000 kWhs	25,584,092
7	3,501 kWhs and above	2,880,723
	<u>Summer Shoulder Peak</u>	
8	1st 500 kWhs	59,597
9	3,000 kWhs	2,427,051
10	3,501 kWhs and above	273,282
	<u>Winter On Peak</u>	
11	1st 500 kWhs	465,283
12	3,000 kWhs	4,964,541
13	3,501 kWhs and above	134,128
	<u>Winter Off Peak</u>	
14	1st 500 kWhs	1,651,151
15	3,000 kWhs	17,617,672
16	3,501 kWhs and above	475,979
17	Revenue	
18	TOTAL R70	
	kWh	64,150,421
	Cust	4,229

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	SPECIAL RESIDENTIAL ELECTRIC SERVICE - R201A - FROZEN	
1	Customers (Single-Phase)	86,138
	<u>Mid-Summer</u>	
2	1st 500 kWhs	777,880
3	3,000 kWhs	27,076,790
4	3,501 kWhs and above	2,295,440
	<u>Remaining Summer</u>	
5	1st 500 kWhs	920,158
6	3,000 kWhs	21,183,679
7	3,501 kWhs and above	790,638
	<u>Winter</u>	
8	1st 500 kWhs	3,035,325
9	3,000 kWhs	34,712,462
10	3,501 kWhs and above	802,397
11	Revenue	
12	TOTAL R201A	
	kWh	91,594,770
	Cust	7,178

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
A		
SPECIAL RESIDENTIAL ELECTRIC SERVICE TIME OF USE - R201B - ELIMINATED - REPLACED BY NEW ELECTRIC SERVICE TIME OF USE - R201BN		
1	Customers	6,353
	<u>Mid-Summer On Peak</u>	
2	1st 500 kWhs	8,987
3	3,000 kWhs	390,920
4	3,501 kWhs and above	55,298
	<u>Mid-Summer Off Peak</u>	
5	1st 500 kWhs	36,423
6	3,000 kWhs	1,584,414
7	3,501 kWhs and above	224,124
	<u>Mid-Summer Shoulder Peak</u>	
8	1st 500 kWhs	3,696
9	3,000 kWhs	160,791
10	3,501 kWhs and above	22,745
	<u>Remaining Summer On Peak</u>	
11	1st 500 kWhs	13,871
12	3,000 kWhs	247,584
13	3,501 kWhs and above	27,406
	<u>Remaining Summer Off Peak</u>	
14	1st 500 kWhs	56,428
15	3,000 kWhs	1,007,149
16	3,501 kWhs and above	111,486
	<u>Remaining Summer Shoulder Peak</u>	
17	1st 500 kWhs	5,280
18	3,000 kWhs	94,245
19	3,501 kWhs and above	10,432
	<u>Winter On Peak</u>	
20	1st 500 kWhs	37,240
21	3,000 kWhs	688,879
22	3,501 kWhs and above	116,884
	<u>Winter Off Peak</u>	
23	1st 500 kWhs	118,573
24	3,000 kWhs	2,193,419
25	3,501 kWhs and above	372,164
26	Revenue	
27	TOTAL R201B	kWh 7,588,438 Cust 529

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
A		
SPECIAL RESIDENTIAL ELECTRIC SERVICE TIME OF USE - R201C - ELIMINATED - REPLACED BY NEW ELECTRIC SERVICE TIME OF USE - R201CN		
1	Customers	2,560
	<u>Mid-Summer On Peak</u>	
2	1st 500 kWhs	2,595
3	3,000 kWhs	123,116
4	3,501 kWhs and above	8,996
	<u>Mid-Summer Off Peak</u>	
5	1st 500 kWhs	11,459
6	3,000 kWhs	543,590
7	3,501 kWhs and above	39,721
	<u>Mid-Summer Shoulder Peak</u>	
8	1st 500 kWhs	1,164
9	3,000 kWhs	55,194
10	3,501 kWhs and above	4,033
	<u>Remaining Summer On Peak</u>	
11	1st 500 kWhs	10,149
12	3,000 kWhs	79,858
13	3,501 kWhs and above	5,064
	<u>Remaining Summer Off Peak</u>	
14	1st 500 kWhs	47,618
15	3,000 kWhs	374,688
16	3,501 kWhs and above	23,760
	<u>Remaining Summer Shoulder Peak</u>	
17	1st 500 kWhs	4,703
18	3,000 kWhs	37,005
19	3,501 kWhs and above	2,347
	<u>Winter On Peak</u>	
20	1st 500 kWhs	26,194
21	3,000 kWhs	194,760
22	3,501 kWhs and above	45,264
	<u>Winter Off Peak</u>	
23	1st 500 kWhs	82,929
24	3,000 kWhs	616,601
25	3,501 kWhs and above	143,303
26	Revenue	
27	TOTAL R201C	kWh 2,484,111 Cust 213
28	TOTAL 201	
29	Revenue	
30		kWh 101,667,319
31		Cust 7,921

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL SUMMARY	
1	TOTAL RESIDENTIAL REVENUE	
2	TOTAL RESIDENTIAL KWHS	3,864,352,371
3	TOTAL RESIDENTIAL CUSTOMERS	357,254

General Service RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	SMALL GENERAL SERVICE - C10 - FROZEN		
1	Customers (Single-Phase)		200,229
2	Customer (Three-Phase)		192,377
3	Energy First 3400 kWh per month		287,747,871
	<u>Summer</u>		
4	1st 500 kWhs		9,543,061
5	next 54,500 kWhs		780,196,667
6	all remaining kWhs		233,692,602
	<u>Winter</u>		
7	1st 500 kWhs		11,971,822
8	next 54,500 kWhs		600,014,346
9	all remaining kWhs		128,023,475
10	Revenue		
11	TOTAL C10	kWh Cust	1,763,441,975 32,717
	SMALL GENERAL SERVICE - PRS 10 - CONTRACT		
12	Revenue		
		kWh Cust	211,780 1
	<u>Summer</u>		
	1st 500 kWhs		500
	next 54,500 kWhs		54,500
	all remaining kWhs		50,890
	<u>Winter</u>		
	1st 500 kWhs		500
	next 54,500 kWhs		54,500
	all remaining kWhs		50,890
	C11		
13	Customers (Single-Phase)		3,948
14	Customer (Three-Phase)		336
15	Energy Summer		33,529,195
16	Energy Winter		26,803,344
17	Revenue		
18	TOTAL C11	kWh Cust	60,332,539 357

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	GENERAL SERVICE TIME OF USE - C76 - ELIMINATED - REPLACED BY NEW GENERAL SERVICE TIME OF USE - R76N		
1	Customers (Single-Phase)		4,203
2	Customer (Three-Phase)		7,473
	<u>Summer On-Peak</u>		
4	1st 500 kWhs		43,611
5	next 54,500 kWhs		9,492,367
6	all remaining kWhs		2,450,884
	<u>Summer Off-Peak</u>		
7	1st 500 kWhs		216,249
8	next 54,500 kWhs		47,069,001
9	all remaining kWhs		12,152,991
	<u>Summer Shoulder Peak</u>		
10	1st 500 kWhs		15,370
11	next 54,500 kWhs		3,345,468
12	all remaining kWhs		863,784
	<u>Winter On Peak</u>		
13	1st 500 kWhs		56,268
14	next 54,500 kWhs		11,544,100
15	all remaining kWhs		1,466,997
	<u>Winter Off Peak</u>		
16	1st 500 kWhs		206,732
17	next 54,500 kWhs		42,414,036
18	all remaining kWhs		5,389,874
19	Revenue		
20	TOTAL C76	kWh Cust	136,727,732 973
	C31		
21	Summer - all Kwhs		11,457,973
22	Winter - all kWhs		4,738,919
23	Revenue		
24	TOTAL C31	kWh Cust	16,196,892 42

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE GENERAL SERVICE - I13 - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N		
1	Customer Charge		7,200
	<u>Summer Demand</u>		
2	On Peak kW		720,000
3	Off Peak kW		720,000
	<u>Winter Demand</u>		
4	On Peak kW		720,000
5	Off Peak kW		720,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		916,524
7	Off Peak kW		916,524
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		916,524
9	Off Peak kW		916,524
	<u>Summer</u>		
10	On Peak kWhs		130,802,332
11	Off Peak kWhs		515,570,740
12	Shoulder Peak kWhs		46,711,075
	<u>Winter</u>		
13	On Peak kWhs		119,944,726
14	Off Peak kWhs		391,199,264
15	Revenue		
16	TOTAL I13	kWh Cust	1,204,228,137 600
17	PRS 13 - CONTRACT		
18		Revenue	
19		kWh	4,088,075
20		Cust	2

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE GENERAL SERVICE TIME OF USE - I85A - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N		
1	Customers		372
	<u>Summer Demand</u>		
2	On Peak kW		36,000
3	Off Peak kW		36,000
	<u>Winter Demand</u>		
4	On Peak kW		36,000
5	Off Peak kW		36,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		21,140
7	Off Peak kW		21,140
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		11,970
9	Off Peak kW		11,970
	<u>Summer</u>		
10	On Peak kWhs		6,151,695
11	Off Peak kWhs		29,592,895
12	Shoulder Peak kWhs		2,126,538
	<u>Winter</u>		
13	On Peak kWhs		5,802,304
14	Off Peak kWhs		22,212,312
15	Revenue		
16	TOTAL I85A	kWh Cust	65,885,743 31

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE GENERAL SERVICE TIME OF USE FROZEN - I85F - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N		
1	Customers		240
	<u>Summer Demand</u>		
2	On Peak kW		24,000
3	Off Peak kW		24,000
	<u>Winter Demand</u>		
4	On Peak kW		24,000
5	Off Peak kW		24,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		36,047
7	Off Peak kW		36,047
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		23,889
9	Off Peak kW		23,889
	<u>Summer</u>		
10	On Peak kWhs		5,748,531
11	Off Peak kWhs		27,935,990
12	Shoulder Peak kWhs		1,956,514
	<u>Winter</u>		
13	On Peak kWhs		5,677,051
14	Off Peak kWhs		21,277,580
15	Revenue		
16	TOTAL I85F	kWh Cust	62,595,666 20

SMALL AND LARGE GENERAL SERVICE SUMMARY

1	TOTAL GENERAL SERVICE REVENUE	
2	TOTAL GENERAL SERVICE KWHS	3,313,708,541
3	TOTAL GENERAL SERVICE CUSTOMERS	34,743

Industrial RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE LIGHT AND POWER - I14 - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N		
1	Customer Charge		96
	<u>Summer Demand</u>		
2	On Peak kW		781,110
3	Off Peak kW		764,707
	<u>Winter Demand</u>		
4	On Peak kW		542,806
5	Off Peak kW		536,292
	<u>Summer</u>		
6	On Peak kWhs	17.7%	58,465,957
7	Off Peak kWhs	76.1%	251,749,604
8	Shoulder Peak kWhs	6.3%	20,711,872
	<u>Winter</u>		
9	On Peak kWhs	22.8%	64,495,493
10	Off Peak kWhs	77.2%	218,674,365
11	Revenue		
12	TOTAL I14	kWh	614,097,291
13		Cust	8
	PRS 14 - CONTRACT		
14	Revenue		
15		kWh	93,850,178
16		Cust	1

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE LIGHT AND POWER TIME OF USE - I90A - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N		
1	Customer Charge		12
	<u>Summer Demand</u>		
2	On Peak kW		41,051
3	Off Peak kW		41,718
	<u>Winter Demand</u>		
4	On Peak kW		41,204
5	Off Peak kW		41,369
	<u>Summer</u>		
6	On Peak kWhs	13.9%	4,368,214
7	Off Peak kWhs	80.6%	25,419,192
8	Shoulder Peak kWhs	5.5%	1,744,779
	<u>Winter</u>		
9	On Peak kWhs	19.0%	5,896,039
10	Off Peak kWhs	81.0%	25,100,381
11	Revenue		
12	TOTAL I90A	kWh	62,528,605
13		Cust	1
			165,342

	LARGE LIGHT AND POWER TIME OF USE FROZEN I90F - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N		
1	Customer Charge		48
	<u>Summer Demand</u>		
2	On Peak kW		148,098
3	Off Peak kW		150,506
	<u>Winter Demand</u>		
4	On Peak kW		132,674
5	Off Peak kW		133,207
	<u>Summer</u>		
6	On Peak kWhs	15.4%	15,169,458
7	Off Peak kWhs	78.8%	77,504,261
8	Shoulder Peak kWhs	5.8%	5,686,028
	<u>Winter</u>		
9	On Peak kWhs	21.1%	16,976,026
10	Off Peak kWhs	78.9%	63,378,144
11	Revenue		
12	TOTAL I90F	kWh	178,713,918
13		Cust	4

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	INDUSTRIAL SERVICE SUMMARY		
1	TOTAL LARGE LIGHT AND POWER SERVICE REVENUE		
2	TOTAL LARGE LIGHT AND POWER KWHS		949,189,992
3	TOTAL LARGE LIGHT AND POWER CUSTOMERS		14

Public Authority RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - PUBLIC AUTHORITY**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	O40		
1	Energy kWh Summer		58,667,833
2	Energy kWh Winter		42,694,636
3	Revenue		
4	TOTAL P40	kWh Cust	101,362,469 3
	P43		
5	Energy kWh Summer		33,365,680
6	Energy kWh Winter		25,062,900
	P45&46 Interruptible Service		
7	Energy kWh Summer		35,724,522
8	Energy kWh Winter		29,743,473
9	Revenue		
10	TOTAL P43	kWh Cust	123,896,575 32

PUBLIC AUTHORITY SERVICE SUMMARY

11	TOTAL PA SERVICE REVENUE	
12	TOTAL PA SERVICE KWHS	225,259,044
13	TOTAL PA SERVICE CUSTOMERS	35

Lighting RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LIGHTING**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	P41&47		
1			33,727,523
2	Revenue		
3		kWh	33,727,523
4		Cust	8
	P50, P51, P52		
5	Per 100 Watt		120,300
6	Per 250 Watt		19,380
7	Per 400 Watt		17,568
8	Per One Pole		3,960
9	Underground Service		47,892
10	55OH - new		504
11	55P -new		1,104
12	55UG -new		1,512
13	70UG -new		2,472
14	Revenue		
15	TOTAL P50	kWh	7,287,604
16		Cust	

LIGHTING SERVICE SUMMARY

17	TOTAL LIGHTING SERVICE REVENUE	
18	TOTAL LIGHTING SERVICE REVENUE KWHS	41,015,127
19	TOTAL LIGHTING SERVICE CUSTOMERS	8

EXHIBIT

DAS-5

DSM AM Calculation

Proposed 2008 DSM Adjustor Mechanism Tariff - Calculation

Customer Class	Customer Months	Annual Energy Consumption - KWH	1st Tier - KWH @ 0X	2nd Tier - KWH @ 1X	3rd Tier - KWH @ 3X	DSMAMTR Energy Equivalent
Residential						
Rate 01						
Single Phase Customer Months	4,102,937					
Poly Phase Customer Months	3,804					
Summer Monthly Energy 1st 500 kWh		157,191,445	157,191,445			0
Summer Monthly Energy Next 3000 kWh		1,944,859,708		1,944,859,708		1,944,859,708
Summer monthly Energy over 3500 kWh		140,610,250			140,610,250	421,830,751
Winter Monthly Energy 1st 500 kWh		280,753,681	280,753,681			0
Winter Monthly Energy Next 3000 kWh		1,095,328,529		1,095,328,529		1,095,328,529
Winter Monthly Energy over 3500 kWh		21,914,549			21,914,549	65,743,647
Subtotal	4,106,741	3,640,658,163	437,945,126	3,040,188,237	162,524,799	3,527,762,635
% of Annual Energy Per Category			12.03%	83.51%	4.46%	96.90%
Rate 21						
Single Phase Customer Months	34,512					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		291,925	291,925			0
Summer Monthly Energy Next 3000 kWh		26,169,378		26,169,378		26,169,378
Summer monthly Energy over 3500 kWh		4,405,393			4,405,393	13,216,180
Winter Monthly Energy 1st 500 kWh		636,300	636,300			0
Winter Monthly Energy Next 3000 kWh		20,392,657		20,392,657		20,392,657
Winter Monthly Energy over 3500 kWh		720,269			720,269	2,160,807
Subtotal	34,512	52,615,922	928,225	46,562,035	5,125,662	61,939,022
% of Annual Energy Per Category			1.76%	88.49%	9.74%	117.72%
Rate 70						
Single Phase Customer Months	50,748					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		838,733	838,733			0
Summer Monthly Energy Next 3000 kWh		34,156,925		34,156,925		34,156,925
Summer monthly Energy over 3500 kWh		3,846,009			3,846,009	11,538,027
Winter Monthly Energy 1st 500 kWh		2,116,434	2,116,434			0
Winter Monthly Energy Next 3000 kWh		22,582,213		22,582,213		22,582,213
Winter Monthly Energy over 3500 kWh		610,107			610,107	1,830,320
Subtotal	50,748	64,150,421	2,955,167	56,739,139	4,456,116	70,107,486
% of Annual Energy Per Category			4.61%	88.45%	6.95%	109.29%
Rate 201 A						
Single Phase Customer Months	86,138					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		1,698,038	1,698,038			0
Summer Monthly Energy Next 3000 kWh		48,260,469		48,260,469		48,260,469
Summer monthly Energy over 3500 kWh		3,086,079			3,086,079	9,258,236
Winter Monthly Energy 1st 500 kWh		3,035,325	3,035,325			0
Winter Monthly Energy Next 3000 kWh		34,712,462		34,712,462		34,712,462
Winter Monthly Energy over 3500 kWh		802,397			802,397	2,407,191
Subtotal	86,138	91,594,770	4,733,363	82,972,931	3,888,476	94,638,359
% of Annual Energy Per Category			5.17%	90.59%	4.25%	103.32%
Rate 201 B						
Single Phase Customer Months	6,353					
Poly Phase Customer Months						
Summer Monthly Energy 1st 500 kWh		124,686	124,686			0
Summer Monthly Energy Next 3000 kWh		3,485,102		3,485,102		3,485,102
Summer monthly Energy over 3500 kWh		451,491			451,491	1,354,473
Winter Monthly Energy 1st 500 kWh		155,813	155,813			0
Winter Monthly Energy Next 3000 kWh		2,882,298		2,882,298		2,882,298
Winter Monthly Energy over 3500 kWh		489,048			489,048	1,467,144
Subtotal	6,353	7,588,438	280,499	6,367,401	940,539	9,189,017
% of Annual Energy Per Category			3.70%	83.91%	12.39%	121.09%

Rate 201 CSingle Phase Customer Months
Poly Phase Customer Months

2,560

Summer Monthly Energy 1st 500 kWh	77,688	77,688			0
Summer Monthly Energy Next 3000 kWh	1,213,451		1,213,451		1,213,451
Summer monthly Energy over 3500 kWh	83,921			83,921	251,764
Winter Monthly Energy 1st 500 kWh	109,123	109,123			0
Winter Monthly Energy Next 3000 kWh	811,362		811,362		811,362
Winter Monthly Energy over 3500 kWh	188,566			188,566	565,699
Subtotal	2,560	2,484,111	186,811	2,024,813	2,842,276
% of Annual Energy Per Category			7.52%	81.51%	114.42%
Total Residential	4,287,053	3,859,091,826	447,029,190	3,234,854,556	177,208,079

Commercial**Rate 10**Single Phase Customer Months
Poly Phase Customer Months

200,229

192,377

Summer Monthly Energy 1st 500 kWh	9,543,561	9,543,561	0	0	0
Summer Monthly Energy Next 54,500 kWh	780,251,167	0	780,251,167	0	780,251,167
Summer monthly Energy over 55,000 kWh	233,743,492	0	0	233,743,492	701,230,477
Winter Monthly Energy 1st 500 kWh	11,972,322	11,972,322	0	0	0
Winter Monthly Energy Next 54,500 kWh	600,068,846	0	600,068,846	0	600,068,846
Winter Monthly Energy over 55,000 kWh	128,074,365	0	0	128,074,365	384,223,096
Subtotal	392,606	1,763,653,755	21,515,883	1,380,320,014	2,465,773,587
% of Annual Energy Per Category			1.22%	78.26%	139.81%

Rate 76Single Phase Customer Months
Poly Phase Customer Months

4,203

7,473

Summer Monthly Energy 1st 500 kWh	275,230	275,230	0	0	0
Summer Monthly Energy Next 54,500 kWh	59,906,836	0	59,906,836	0	59,906,836
Summer monthly Energy over 55,000 kWh	15,467,659	0	0	15,467,659	46,402,976
Winter Monthly Energy 1st 500 kWh	263,000	263,000	0	0	0
Winter Monthly Energy Next 54,500 kWh	53,958,136	0	53,958,136	0	53,958,136
Winter Monthly Energy over 55,000 kWh	6,856,871	0	0	6,856,871	20,570,613
Subtotal	11,676	136,727,732	538,230	113,864,972	180,838,561
% of Annual Energy Per Category			0.39%	83.28%	132.26%

Rate 11Single Phase Customer Months
Poly Phase Customer Months

3,948

336

Annual kWh	93,861,735	0	93,861,735	0	93,861,735
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Rate 31

Rate 31	499	27,654,866	0	27,654,866	0	27,654,866
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Total Commercial	408,729	1,928,040,301	22,054,113	1,521,839,852	384,142,387	2,674,287,014
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Industrial

RT-13	7,200	1,204,228,137	0	1,204,228,137	0	1,204,228,137
RT-13PRS	24	4,088,075	0	4,088,075	0	4,088,075
RT-14	96	614,097,291	0	614,097,291	0	614,097,291
RT-14PRS	12	93,850,178	0	93,850,178	0	93,850,178
RT-85	612	128,481,410	0	128,481,410	0	128,481,410
RT-90	60	241,242,523	0	241,242,523	0	241,242,523
Subtotal	8,004	2,285,987,614	0	2,285,987,614	0	2,285,987,614
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Mining

RT-15	24	926,300,900	0	926,300,900	0	926,300,900
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Public Streets and Highway Lighting

RT-41	48	24,132,797	0	24,132,797	0	24,132,797
RT-47	48	9,397,676	0	9,397,676	0	9,397,676
Subtotal	96	33,530,473	0	33,530,473	0	33,530,473
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Other Sales - Public Authorities

RT-40	36	101,171,460	0	101,171,460	0	101,171,460
RT-43	3,212	123,574,584	0	123,574,584	0	123,574,584
Subtotal	3,248	224,746,044	0	224,746,044	0	224,746,044
% of Annual Energy Per Category			0.00%	100.00%	0.00%	100.00%

Lighting

RT-50	216		0	0	0	0
RT-51	14,628		0	0	0	0
RT-52	39,276		0	0	0	0
Subtotal	53,904	7,287,604	0	7,287,604	0	7,287,604
% of Annual Energy Per Category			0.00%	0.00%	0.00%	100.00%

Total	4,707,154	9,257,697,157	469,083,303	8,227,259,439	561,350,467	9,911,310,839	Estimated Total DSM Qualifying Adjusted Retail Sales
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% of Annual Energy Per Category =			5.29%	92.61%	6.33%	111.58%
% of Annual DSM Revenue Per Category =			0.00%	82.99%	17.01%	

0

Energy consumption Growth Rate for Next Year without DSM 3.59%

DSM Program Energy Consumption Reduction Expected in kWh next year: 34,700,000

DSM Basic Program Balance and Expenses - Next Year = \$6,384,625

DSM Adjustor Mechanism Tariff Rate First Tier per KWH =

\$0.000000

DSM Adjustor Mechanism Tariff Rate Second Tier per KWH =

\$0.000624

DSM Adjustor Mechanism Tariff Rate Third Tier per KWH =

Residential RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL- R01 - FROZEN	
1	Customers (Single-Phase)	4,102,937
2	Customer (Three-Phase)	3,804
	<u>Summer</u>	
4	1st 500 kWhs	157,191,445
5	3,000 kWhs	1,944,859,708
6	3,501 kWhs and above	140,610,250
	<u>Winter</u>	
7	1st 500 kWhs	280,753,681
8	3,000 kWhs	1,095,328,529
9	3,501 kWhs and above	21,914,549
10	Revenue	
11	TOTAL R01 - FROZE kWh	3,640,658,163
12	Cust	342,228
	RESIDENTIAL WATER HEATING - R02	
13	Customers	28,728
14	1st 100 kWhs - is a customer charge	2,472,456
15	All Additional kWhs	2,788,089
16	Revenue	
17	TOTAL R02 kWh	5,260,545
18	Cust	

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
	A	
	RESIDENTIAL TIME OF USE - R21 - ELIMINATED - REPLACED BY NEW TIME OF USE - R70N	
1	Customer Charge	34,512
	<u>Summer On Peak</u>	
2	1st 500 kWhs	117,504
3	3,000 kWhs	10,533,594
4	3,501 kWhs and above	1,773,241
	<u>Summer Off Peak</u>	
5	1st 500 kWhs	174,420
6	3,000 kWhs	15,635,784
7	3,501 kWhs and above	2,632,152
	<u>Summer Shoulder Peak</u>	
8	1st 500 kWhs	0
9	3,000 kWhs	0
10	3,501 kWhs and above	0
	<u>Winter On Peak</u>	
11	1st 500 kWhs	149,837
12	3,000 kWhs	4,802,085
13	3,501 kWhs and above	169,610
	<u>Winter Off Peak</u>	
14	1st 500 kWhs	486,463
15	3,000 kWhs	15,590,572
16	3,501 kWhs and above	550,659
17	Revenue	
18	TOTAL R21	52,615,922
	kWh	
	Cust	2,876

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
	A	
	RESIDENTIAL TIME OF USE - R70 - ELIMINATED - REPLACED BY NEW TIME OF USE - R70N	
1	Customers	50,748
	<u>Summer On Peak</u>	
2	1st 500 kWhs	150,911
3	3,000 kWhs	6,145,782
4	3,501 kWhs and above	692,004
	<u>Summer Off Peak</u>	
5	1st 500 kWhs	628,225
6	3,000 kWhs	25,584,092
7	3,501 kWhs and above	2,880,723
	<u>Summer Shoulder Peak</u>	
8	1st 500 kWhs	59,597
9	3,000 kWhs	2,427,051
10	3,501 kWhs and above	273,282
	<u>Winter On Peak</u>	
11	1st 500 kWhs	465,283
12	3,000 kWhs	4,964,541
13	3,501 kWhs and above	134,128
	<u>Winter Off Peak</u>	
14	1st 500 kWhs	1,651,151
15	3,000 kWhs	17,617,672
16	3,501 kWhs and above	475,979
17	Revenue	
18	TOTAL R70	64,150,421
	kWh	
	Cust	4,229

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	SPECIAL RESIDENTIAL ELECTRIC SERVICE - R201A - FROZEN	
1	Customers (Single-Phase)	86,138
	<u>Mid-Summer</u>	
2	1st 500 kWhs	777,880
3	3,000 kWhs	27,076,790
4	3,501 kWhs and above	2,295,440
	<u>Remaining Summer</u>	
5	1st 500 kWhs	920,158
6	3,000 kWhs	21,183,679
7	3,501 kWhs and above	790,638
	<u>Winter</u>	
8	1st 500 kWhs	3,035,325
9	3,000 kWhs	34,712,462
10	3,501 kWhs and above	802,397
11	Revenue	
12	TOTAL R201A	
	kWh	91,594,770
	Cust	7,178

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line	Pricing Plan	Adjusted Booked Billing Determinants
A		
SPECIAL RESIDENTIAL ELECTRIC SERVICE TIME OF USE - R201B - ELIMINATED - REPLACED BY NEW ELECTRIC SERVICE TIME OF USE - R201BN		
1	Customers	6,353
	<u>Mid-Summer On Peak</u>	
2	1st 500 kWhs	8,987
3	3,000 kWhs	390,920
4	3,501 kWhs and above	55,298
	<u>Mid-Summer Off Peak</u>	
5	1st 500 kWhs	36,423
6	3,000 kWhs	1,584,414
7	3,501 kWhs and above	224,124
	<u>Mid-Summer Shoulder Peak</u>	
8	1st 500 kWhs	3,696
9	3,000 kWhs	160,791
10	3,501 kWhs and above	22,745
	<u>Remaining Summer On Peak</u>	
11	1st 500 kWhs	13,871
12	3,000 kWhs	247,584
13	3,501 kWhs and above	27,406
	<u>Remaining Summer Off Peak</u>	
14	1st 500 kWhs	56,428
15	3,000 kWhs	1,007,149
16	3,501 kWhs and above	111,486
	<u>Remaining Summer Shoulder Peak</u>	
17	1st 500 kWhs	5,280
18	3,000 kWhs	94,245
19	3,501 kWhs and above	10,432
	<u>Winter On Peak</u>	
20	1st 500 kWhs	37,240
21	3,000 kWhs	688,879
22	3,501 kWhs and above	116,884
	<u>Winter Off Peak</u>	
23	1st 500 kWhs	118,573
24	3,000 kWhs	2,193,419
25	3,501 kWhs and above	372,164
26	Revenue	
27	TOTAL R201B	7,588,438
	kWh	
	Cust	529

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
A		
SPECIAL RESIDENTIAL ELECTRIC SERVICE TIME OF USE - R201C - ELIMINATED - REPLACED BY NEW ELECTRIC SERVICE TIME OF USE - R201CN		
1	Customers	2,560
	<u>Mid-Summer On Peak</u>	
2	1st 500 kWhs	2,595
3	3,000 kWhs	123,116
4	3,501 kWhs and above	8,996
	<u>Mid-Summer Off Peak</u>	
5	1st 500 kWhs	11,459
6	3,000 kWhs	543,590
7	3,501 kWhs and above	39,721
	<u>Mid-Summer Shoulder Peak</u>	
8	1st 500 kWhs	1,164
9	3,000 kWhs	55,194
10	3,501 kWhs and above	4,033
	<u>Remaining Summer On Peak</u>	
11	1st 500 kWhs	10,149
12	3,000 kWhs	79,858
13	3,501 kWhs and above	5,064
	<u>Remaining Summer Off Peak</u>	
14	1st 500 kWhs	47,618
15	3,000 kWhs	374,688
16	3,501 kWhs and above	23,760
	<u>Remaining Summer Shoulder Peak</u>	
17	1st 500 kWhs	4,703
18	3,000 kWhs	37,005
19	3,501 kWhs and above	2,347
	<u>Winter On Peak</u>	
20	1st 500 kWhs	26,194
21	3,000 kWhs	194,760
22	3,501 kWhs and above	45,264
	<u>Winter Off Peak</u>	
23	1st 500 kWhs	82,929
24	3,000 kWhs	616,601
25	3,501 kWhs and above	143,303
26	Revenue	
27	TOTAL R201C	
	kWh	2,484,111
	Cust	213
28	TOTAL 201	
29	Revenue	
30	kWh	101,667,319
31	Cust	7,921

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - RESIDENTIAL**

Line No.	Pricing Plan	Adjusted Booked Billing Determinants
		A
	RESIDENTIAL SUMMARY	
1	TOTAL RESIDENTIAL REVENUE	
2	TOTAL RESIDENTIAL KWHS	3,864,352,371
3	TOTAL RESIDENTIAL CUSTOMERS	357,254

General Service RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	SMALL GENERAL SERVICE - C10 - FROZEN		
1	Customers (Single-Phase)		200,229
2	Customer (Three-Phase)		192,377
3	Energy First 3400 kWh per month		287,747,871
	<u>Summer</u>		
4	1st 500 kWhs		9,543,061
5	next 54,500 kWhs		780,196,667
6	all remaining kWhs		233,692,602
	<u>Winter</u>		
7	1st 500 kWhs		11,971,822
8	next 54,500 kWhs		600,014,346
9	all remaining kWhs		128,023,475
10	Revenue		
11	TOTAL C10	kWh Cust	1,763,441,975 32,717
	SMALL GENERAL SERVICE - PRS 10 - CONTRACT		
12	Revenue		
		kWh Cust	211,780 1
	<u>Summer</u>		
	1st 500 kWhs		500
	next 54,500 kWhs		54,500
	all remaining kWhs		50,890
	<u>Winter</u>		
	1st 500 kWhs		500
	next 54,500 kWhs		54,500
	all remaining kWhs		50,890
	C11		
13	Customers (Single-Phase)		3,948
14	Customer (Three-Phase)		336
15	Energy Summer		33,529,195
16	Energy Winter		60,332,539
17	Revenue		
18	TOTAL C11	kWh Cust	93,861,735 357

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
A			
GENERAL SERVICE TIME OF USE - C76 - ELIMINATED - REPLACED BY NEW GENERAL SERVICE TIME OF USE - R76N			
1	Customers (Single-Phase)		4,203
2	Customer (Three-Phase)		7,473
	<u>Summer On-Peak</u>		
4	1st 500 kWhs		43,611
5	next 54,500 kWhs		9,492,367
6	all remaining kWhs		2,450,884
	<u>Summer Off-Peak</u>		
7	1st 500 kWhs		216,249
8	next 54,500 kWhs		47,069,001
9	all remaining kWhs		12,152,991
	<u>Summer Shoulder Peak</u>		
10	1st 500 kWhs		15,370
11	next 54,500 kWhs		3,345,468
12	all remaining kWhs		863,784
	<u>Winter On Peak</u>		
13	1st 500 kWhs		56,268
14	next 54,500 kWhs		11,544,100
15	all remaining kWhs		1,466,997
	<u>Winter Off Peak</u>		
16	1st 500 kWhs		206,732
17	next 54,500 kWhs		42,414,036
18	all remaining kWhs		5,389,874
19	Revenue		
20	TOTAL C76	kWh Cust	136,727,732 973
C31			
21	Summer - all Kwhs		11,457,973
22	Winter - all kWhs		16,196,892
23	Revenue		
24	TOTAL C31	kWh Cust	27,654,866 42

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE GENERAL SERVICE - I13 - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N		
1	Customer Charge		7,200
	<u>Summer Demand</u>		
2	On Peak kW		720,000
3	Off Peak kW		720,000
	<u>Winter Demand</u>		
4	On Peak kW		720,000
5	Off Peak kW		720,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		916,524
7	Off Peak kW		916,524
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		916,524
9	Off Peak kW		916,524
	<u>Summer</u>		
10	On Peak kWhs		130,802,332
11	Off Peak kWhs		515,570,740
12	Shoulder Peak kWhs		46,711,075
	<u>Winter</u>		
13	On Peak kWhs		119,944,726
14	Off Peak kWhs		391,199,264
15	Revenue		
16	TOTAL I13	kWh Cust	1,204,228,137 600
17	PRS 13 - CONTRACT		
18		Revenue	
19		kWh	4,088,075
20		Cust	2

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE GENERAL SERVICE TIME OF USE - I85A - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N		
1	Customers		372
	<u>Summer Demand</u>		
2	On Peak kW		36,000
3	Off Peak kW		36,000
	<u>Winter Demand</u>		
4	On Peak kW		36,000
5	Off Peak kW		36,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		21,140
7	Off Peak kW		21,140
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		11,970
9	Off Peak kW		11,970
	<u>Summer</u>		
10	On Peak kWhs		6,151,695
11	Off Peak kWhs		29,592,895
12	Shoulder Peak kWhs		2,126,538
	<u>Winter</u>		
13	On Peak kWhs		5,802,304
14	Off Peak kWhs		22,212,312
15	Revenue		
16	TOTAL I85A	kWh	65,885,743
		Cust	31

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - GENERAL SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
A			
LARGE GENERAL SERVICE TIME OF USE FROZEN - I85F - ELIMINATED - REPLACED BY NEW LARGE GENERAL SERVICE TIME OF USE - I85N			
1	Customers		240
	<u>Summer Demand</u>		
2	On Peak kW		24,000
3	Off Peak kW		24,000
	<u>Winter Demand</u>		
4	On Peak kW		24,000
5	Off Peak kW		24,000
	<u>Summer Demand All Additional kW</u>		
6	On Peak kW		36,047
7	Off Peak kW		36,047
	<u>Winter Demand All Additional kW</u>		
8	On Peak kW		23,889
9	Off Peak kW		23,889
	<u>Summer</u>		
10	On Peak kWhs		5,748,531
11	Off Peak kWhs		27,935,990
12	Shoulder Peak kWhs		1,956,514
	<u>Winter</u>		
13	On Peak kWhs		5,677,051
14	Off Peak kWhs		21,277,580
15	Revenue		
16	TOTAL I85F	kWh	62,595,666
		Cust	20

SMALL AND LARGE GENERAL SERVICE SUMMARY

1	TOTAL GENERAL SERVICE REVENUE	
2	TOTAL GENERAL SERVICE KWHS	3,358,695,709
3	TOTAL GENERAL SERVICE CUSTOMERS	34,743

Industrial RD

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	LARGE LIGHT AND POWER - I14 - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N		
1	Customer Charge		96
	<u>Summer Demand</u>		
2	On Peak kW		781,110
3	Off Peak kW		764,707
	<u>Winter Demand</u>		
4	On Peak kW		542,806
5	Off Peak kW		536,292
	<u>Summer</u>		
6	On Peak kWhs	17.7%	58,465,957
7	Off Peak kWhs	76.1%	251,749,604
8	Shoulder Peak kWhs	6.3%	20,711,872
	<u>Winter</u>		
9	On Peak kWhs	22.8%	64,495,493
10	Off Peak kWhs	77.2%	218,674,365
11	Revenue		
12	TOTAL I14	kWh	614,097,291
13		Cust	8
	PRS 14 - CONTRACT		
14	Revenue		
15		kWh	93,850,178
16		Cust	1

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
A			
LARGE LIGHT AND POWER TIME OF USE - I90A - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N			
1	Customer Charge		12
	<u>Summer Demand</u>		
2	On Peak kW		41,051
3	Off Peak kW		41,718
	<u>Winter Demand</u>		
4	On Peak kW		41,204
5	Off Peak kW		41,369
	<u>Summer</u>		
6	On Peak kWhs	13.9%	4,368,214
7	Off Peak kWhs	80.6%	25,419,192
8	Shoulder Peak kWhs	5.5%	1,744,779
	<u>Winter</u>		
9	On Peak kWhs	19.0%	5,896,039
10	Off Peak kWhs	81.0%	25,100,381
11	Revenue		
12	TOTAL I90A	kWh	62,528,605
13		Cust	1
			165,342

LARGE LIGHT AND POWER TIME OF USE FROZEN I90F - ELIMINATED - REPLACED BY NEW LARGE LIGHT AND POWER TIME OF USE - I90N			
1	Customer Charge		48
	<u>Summer Demand</u>		
2	On Peak kW		148,098
3	Off Peak kW		150,506
	<u>Winter Demand</u>		
4	On Peak kW		132,674
5	Off Peak kW		133,207
	<u>Summer</u>		
6	On Peak kWhs	15.4%	15,169,458
7	Off Peak kWhs	78.8%	77,504,261
8	Shoulder Peak kWhs	5.8%	5,686,028
	<u>Winter</u>		
9	On Peak kWhs	21.1%	16,976,026
10	Off Peak kWhs	78.9%	63,378,144
11	Revenue		
12	TOTAL I90F	kWh	178,713,918
13		Cust	4

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LARGE LIGHT AND POWER SERVICE

Line No.	Pricing Plan	Total	Adjusted
			Booked Billing Determinants
			A
	INDUSTRIAL SERVICE SUMMARY		
1	TOTAL LARGE LIGHT AND POWER SERVICE REVENUE		
2	TOTAL LARGE LIGHT AND POWER KWHS		949,189,992
3	TOTAL LARGE LIGHT AND POWER CUSTOMERS		14

Public Authority RD

TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - PUBLIC AUTHORITY

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	O40		
1	Energy kWh Summer		58,667,833
2	Energy kWh Winter		101,362,469
3	Revenue		
4	TOTAL P40	kWh Cust	160,030,302 3
	P43		
5	Energy kWh Summer		33,365,680
6	Energy kWh Winter		25,062,900
	P45&46 Interruptible Service		
7	Energy kWh Summer		35,724,522
8	Energy kWh Winter		29,743,473
9	Revenue		
10	TOTAL P43	kWh Cust	123,896,575 32

PUBLIC AUTHORITY SERVICE SUMMARY

11	TOTAL PA SERVICE REVENUE	
12	TOTAL PA SERVICE KWHS	283,926,877
13	TOTAL PA SERVICE CUSTOMERS	35

Lighting RD

**TUCSON ELECTRIC POWER COMPANY
FOR PERIOD ENDING DECEMBER 31, 2006
PROOF OF REVENUE - LIGHTING**

Line No.	Pricing Plan	Total	Adjusted Booked Billing Determinants
			A
	P41&47		
1			33,727,523
2	Revenue		
3		kWh	33,727,523
4		Cust	8
	P50, P51, P52		
5	Per 100 Watt		120,300
6	Per 250 Watt		19,380
7	Per 400 Watt		17,568
8	Per One Pole		3,960
9	Underground Service		47,892
10	55OH - new		504
11	55P -new		1,104
12	55UG -new		1,512
13	70UG -new		2,472
14	Revenue		
15	TOTAL P50	kWh	7,287,604
16		Cust	

LIGHTING SERVICE SUMMARY

17	TOTAL LIGHTING SERVICE REVENUE	
18	TOTAL LIGHTING SERVICE REVENUE KWHS	41,015,127
19	TOTAL LIGHTING SERVICE CUSTOMERS	8

1st Yr Portfolio Plan - Budget

Budgets

**2008 Portfolio Budgets - Used in
Portfolio Plan**

Program
Education and Outreach
Direct Load Control
Residential Efficiency Programs
Low Income Weatherization
New Home Construction
Residential HVAC Retrofit
Shade Tree Program
CFL Buydown Program
Residential Subtotal
Non-Residential Efficiency Programs
Existing Facilities Program
Small Business Program
Existing Facilities Program
Non-Residential Subtotal
Total

EXHIBIT

DAS-6

TEP's DSM Efficiency Incentive Mechanism Calculation Description and Example

Calculation Description:

The DSM Efficiency Incentive Mechanism is intended to provide a financial incentive to install otherwise more expensive energy efficient equipment as part of the electric grid or in partnership with customers. In order for equipment to qualify for enhanced financial recovery, it must provide at least 15% lower losses in the case of transmission or distribution equipment or 15% better energy utilization in the case of energy conversion equipment, than similarly functioning cost effective equipment. The energy efficient asset can not cost more than 20% more than the similarly functioning asset that would most cost effectively serve TEP's purpose without any extra financial incentives.

The extra financial incentive would be provided by including the value of the energy efficiency asset in the utility rate base at the next rate case for full revenue recovery in the same manner as all other similar utility assets and, in addition, including 1% of the original value of the energy efficiency asset to be recovered each year for the first five years in the DSM Adjustor Mechanism after the energy efficiency asset is operational and in service.

Prior to the purchase of an energy efficient asset TEP will submit to the ACC Staff who then shall review and recommend Commission approval for each energy efficiency asset to be afforded enhanced financial recovery. TEP shall submit sufficient evidence as is needed to demonstrate that the energy efficient asset meets the qualification criterion established above.

Use of the DSM Efficiency Incentive Mechanism would require TEP to annually file in the DSM filing the following information:

- A statement of the original value of each energy efficient asset and the year it first was claimed for enhanced financial incentive.
- The total value of the aggregate of all energy efficient assets claimed for enhanced financial incentive in the next year ("TVAAEEA").
- The estimated total retail sales of electrical energy in kWh for the next year ("TRSOEE") before expected DSM program-created energy consumption reductions are included.
- The estimated DSM program-created energy consumption reductions in the next year ("DSMECRCY").

The DSM Efficiency Incentive Rate ("DSMEIR") would then be calculated as:

$$\text{DSMEIR in \$/kWh} = ((\text{TVAAEEA} * 0.01) / (\text{TRSOEE} - \text{DSMECRCY}))$$

Example:

A hypothetical example calculating the DSMEIR for 2009: In February 2008, a line reconductor project is completed, operational and in service using a 4/0 copper conductor resulting in a line segment with 22% lower lifetime losses than the 1/0 copper conductor that was otherwise the most cost effective. The total project cost was \$850,000 which was 118% of the cost of the 1/0 copper conductor. The 4/0 copper conductor was approved for enhanced financial incentive treatment by the ACC in December 2007. It was the only asset approved at the time the 2009 DSM Adjustor Mechanism Rate filing was submitted.

The 2009 TRSOEE before DSM measures is expected to be 10,200,000,000 kWh. DSMECRCY in 2009 are expected to be 145,000,000 kWh. The DSM Efficiency Incentive Rate for 2009 would be:

$$((850,000 * 0.01) / (10,200,000,000 - 145,000,000)) = \$0.00000085 / \text{kWh}$$

This would then be added to the other components to build the DSM Adjustor Mechanism Tariff Rate for 2009, plus for an additional four years.

EXHIBIT

DAS-7

TEP's DSM Performance Incentive Mechanism Calculation Description and Example

The intended result of successful energy efficiency programs is the reduction of electric energy consumption and/or electric demand. While this reduces the variable and/or fixed costs of producing electrical energy for an electric utility, it also reduces the revenue derived from energy consumption based rates and reduces the opportunity for the utility to earn a return on assets. These intended results are mitigated by the implementation of a performance incentive by providing customers with a 90% share and TEP with 10% share of the overall net benefits of the DSM Portfolio excluding the Direct Load Control program, the Low-Income Weatherization program and the Educational and the Outreach Programs. During the first year of DSM programs would most likely produce reduced or negative net benefits. Therefore, the performance incentive would start after the first full year of implementation – giving time for programs to ramp up and reach their savings potential.

Use of the DSM Performance Incentive Mechanism would require TEP to annually file the following information:

- TEP will report actual net DSM Portfolio benefits (Program Benefits minus the Program costs). The net benefits will be verified through the Measurement and Evaluation process.
- The net benefits will be calculated each reporting period and will be included in the next annual true up in TEP's DSM adjustor mechanism.
- The total of each program's net benefits (or net costs) will be calculated and summed.
- The Direct Load Control (DLC), Low-Income Weatherization (LIW) and the Education and Outreach programs are outside of the scope of the performance incentive and will not be considered with the net benefits or the spending cap. The Education and Outreach Program will not have saving assigned to it and the LIW Program is expected to produce a negative net cost to society. The DLC program results primarily in capacity reductions, not energy savings and is thus not appropriate for being included in the DSM Performance Incentive. (See Program Descriptions DAS – 1 attachments 1,2 and 3)
- After the Portfolio's net benefits are summed then a 10% cap (of period spending) will be applied to determine the maximum amount of the performance incentive.
- The lesser of the 10% cap or the sum of the net benefits will be the total DSM performance incentive and added to the DSM Adjustor Mechanism.

See the attached example below.

**Example of an Estimated DSM Performance Incentive
2008 Program Portfolio**

Program	Total Benefits	Total Costs	Net Benefits	TEP – @ 100%
Residential Efficiency Programs				
New Home Construction	\$12,487,377	\$4,765,342	\$7,722,035	\$7,722,035
Residential HVAC Retrofit	\$1,086,090	\$641,333	\$444,757	\$444,757
Shade Tree Program	\$451,828	\$267,514	\$184,315	\$184,315
CFL Buydown Program	\$3,602,232	\$1,270,206	\$2,332,026	\$2,332,026
Non-Residential Efficiency Programs				
Existing Facilities Program	\$7,162,266	\$1,797,368	\$5,364,898	\$5,364,898
Small Business Program	\$2,879,203	\$1,063,992	\$1,815,211	\$1,815,211
Efficient Commercial Building Design	\$2,763,623	\$1,319,383	\$1,444,240	\$1,444,240
Performance Incentive				
Total Program Saving – Net Benefits @ 10% total program Cap				\$2,077,730
Cap – 10% of spending (assuming a \$12.4 M Budget)				\$1,236,294
Total DSM Performance Incentive				\$1,236,294
Outside the Scope of the Performance Incentive				
Direct Load Control	\$5,440,427	\$3,970,500	\$1,469,927	\$146,993
Education and Outreach	NA	NA	NA	NA
Low Income Weatherization	\$251,584	\$373,663	-\$122,079	NA